ESM 489

MANAGEMENT INFORMATION SYSTEMS IN RETAIL FOOD FIRMS: TECHNICAL SUPPLEMENT ON COMPUTER PROGRAMS

by

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INTRODUCTION

This publication is a technical supplement to OARDC Research Bulletin 1062, Management Information Systems in Retail Food Firms.[1] It provides technical information on the computerized information systems developed by the authors for retail produce and meat operations. This supplement is thus intended for the use of researchers and data processing personnel who wish to obtain more information on the OARDC systems than provided in Bulletin 1062. All readers should be familiar with the material contained in Chapter 3 of the bulletin before reading this supplement.

Section 1 of this supplement provides the operating instructions and a detailed description of the inputs required for the two programs. This is followed in Section 2 by a copy of the computer program for the meat system. Section 3 contains labor coefficients that can be used in the meat and produce systems and provides additional comments on the way such coefficients should be utilized.

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[1]This bulletin was published by the Ohio Agricultural Research and Development Center, Wooster, Ohio, in June, 1973. Copies are available from OARDC or from the junior author.

SECTION 1

Description of Programs & Operating Instructions

These two programs compute and analyze item sales data for store level meat and produce departments by using the "missing inventory" method of calculation. The general design of the programs incorporates a Master Deck of item data which is constant for all stores being processed. The individual store data is stacked behind this Master Deck and is processed one store at a time for an unlimited number of stores. The programs are written in Fortran IV computer language, specifically for the IBM 7094 computer installation at The Ohio State University. Modifications to convert these programs for use on the IBM 360 computer would be slight.

The two programs are highly flexible in terms of the variety of input and output data possible. In addition to the item sales and profit calculations, the programs allow for:

1. a printout of features
2. the inclusion of cutting-test calculation (meat program only)
3. item input and output combinations
4. the inclusion of labor standards
5. different quantities and types of output printouts
6. adjustments for shrinkage

The two programs are very similar and a general correspondence will be noted among most input and output variables between the programs. The meat program will be discussed in detail first. The description of the produce program will follow. Because of the correspondence, the reader will be asked to refer back to the meat program section for a description of common variables.

Meat Recap Program

(Required Order, Description, and Definition of Input)

R[1] Week Number Card -- 1 card only

	Columns[2]	
R	1,2	Number of week. Weeks must be numbered from 1-52 or 53 and must be consistent with location of inventories on inventory cards.
NR[3]	3,4	Number of inventory combinations desired. Since the data is computed item by item, it can be desirable to combine inventories for any items which are difficult to accurately inventory separately. This value refers to the number of combinations to be performed--not to the number of items to be combined. For instance, a combination involving three items is still only one combination. The maximum number of items that can be combined into one combination is 9. The maximum number of combinations allowed is 25. See Inventory Combinations Deck.

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[1] "R" means that the card or values are required to operate the program.

[2] See also the coding forms at the end of this paper for card layout information.

[3] "NR" means that the card or values are not required to operate the program.

	Columns	
NR	5,6	Number of output combinations desired. This option is similar to the inventory combination option in that it combines the values calculated for two or more items. The program makes all calculations for each item involved and then sums these together and assigns the values to the remaining item. The limits are the same as those for the inventory combinations. See Output Combinations Deck.
NR	7,8	Number of features to be printed. The program allows the items on feature to be read-in and printed out along with the sales data generated for easy reference. The program does nothing with this data--except print it. In the space provided, put the total number of features to be read-in. Limit: 40 feature items may be read-in. See Features Deck.
R	9,10	Conversion to pounds index. If <u>any</u> of the shipping data (Detail Deck) is being recorded in cases delivered, such as weiners being recorded as 1 case rather than 12 pounds, the program will convert the data to "pounds" if "99" is placed in this space. To sort out the items to be converted, an inventory card for each item with the value of "2" in Column 71 is required. See Inventory Deck. If <u>all</u> items are being recorded in pounds, leave this space blank.
R	11,12	Number of classes. The program will permit up to thirty classes of products. The class names are read-in and are used to group the individual items in the print-out and for labor calculations.
	13-62	Not used.
NR	63-80	Print either numerically or alphabetically the calendar date representing the week ending date of the data. (For print-out purposes only.)

R Class Name Deck -- Same number of cards as number of classes.

	Columns	
NR	1-3	Class Number. For card handling purposes; not used by program.
R	4-21	Print class name in these columns.

NOTE: Repeat this format for each card of the deck. The program assumes the first card is class number 1, the second is class number 2, etc.

NR Features Deck--Same number of cards as number of features. (Used only for printing out list of features).

	Columns	
NR	1-10	User I.D. for week number and card number.
R	11-46	Print name of product featured and perhaps some classification as to its importance in the ad. One method is to use "X" to show amount of price cut, location, size, color, and boldness of type for the item featured. The more X's, the more important is the item featured.
R	47-49	(F3.2) Feature price per pound or per package.

Repeat this format for each card in the deck.

NR Inventory Combinations Deck--Same number of cards as number of inventory combinations + 1.

R	Card No. 1	1 Card only.
	Columns	
	1-N	Where N = the number of inventory combinations ($N \leq 25$). In each column place the number of individual items to be combined for each combination. I.e., if the first combination involves combining the inventories of 5 items, 5 would be recorded in Column 1.

Columns

R Card Nos. 2 through N + 1---Items whose inventories are to be combined.

1-4 Print first item number of those involved in combination.

5-8 Print second item number of those involved in combination.

9-12 Etc.

Etc.

Example: If two inventory combinations are desired, such that item number 9305 is to be combined into item 9307, and items 2105 and 2106 are to be combined into 2109, then the number of inventory combinations on week number card (Col. 3,4) would be "2", and the inventory combination deck would look as follows:

Card No. 1	2	3									
cols.	1	2									
Card No. 2	9	3	0	5	9	3	0	7			
cols.	1	2	3	4	5	6	7	8			
Card No. 3	2	1	0	5	2	1	0	6	2	1	0	9
cols.	1	2	3	4	5	6	7	8	9	10	11	12

NOTE: The last number printed is always the surviving item--E.g., 9307 and 2109.

NR Output Combinations Deck--Same number of cards as number of output combinations + 1.

Identical instructions as for Inventory Combinations Deck.

R Master Deck--Any number of cards (1 per item) up to 425.

Columns

R 1 Leave blank except for last card in deck. Put a "9" in Column 1 of last card to signal end of master deck.

R 2-5 Item number. Any number not to exceed 4 digits.

	Columns	
R	6-8	(F3.0) Number of selling units per pack. For items shipped by pounds, the value would be "1." This value must correspond to the average weight such that the weight per selling unit can be established. Example: If the item in question is weiners in which cartons containing 12 one pound packages are the shipping unit, the number of units per pack is 12 and the average weight per shipping unit is 12 pounds.
NR	9,10	Blank
R	11-34	Name of the item.
R	35-39	(F5.4) Retail price per pound.
R	40-42	(F3.0) Average weight per shipping unit.
R	43-47	(F5.4) Cost per pound.
R	48,49	Class number within which item is to be classified.

Repeat format for all cards. These cards must be submitted with item numbers in ascending order.

The data provided by all of the cards listed to this point are used as a common data set for all stores being processed. I.e., they need to be read-in only once regardless of number of stores. The data unique to each store are provided by the data cards which follow. These data cards are repeated for each store to be processed.

R Store Number Card -- 1 card only.

	columns	
R	1,2	Number of store associated with the following data.

	Columns	
NR	3-11	(F9.2) Dollar amount of "cash register" sales realized for the corresponding week and department.
NR	12-17	(F6.1) Actual number of labor hours used in the department during the corresponding week.
NR	18-21	(F4.2) Average wage rate
R	22,23	Check for completeness. The program will check for the completeness of the master deck, detail, and inventory data if "99" is put in these columns and print out "missing" cards and data. If not desired, leave blank.
NR	24,25	Number of labor cards. The program will compute labor requirements by class and for the total department using coefficients supplied and those already in the program, if the number of labor cards is put in these columns. The user must supply the direct labor coefficients and the program provides the indirect labor coefficients. These coefficients were taken from Research Bulletin No. 982, Ohio Agricultural Research and Development Center, Meat Department Labor Requirements by Marion, Ott, and Walker. If this option is not desired, leave columns blank. See Labor Data Deck.
NR	26,27	Number of cutting tests to be read-in. If none, leave blank. See Cutting Tests.
NR	28,29	Number of cutting tests to be combined--value refers to the number of combinations, not the number of tests. If none, leave blank. See Cutting Tests.
NR	30-33	(F4.2) Number of customer service transactions in hundreds per week. Required if customer service labor data is desired.
R	34,35	Item analysis option. The program automatically prints a class summary of sales and profitability. If an item by item analysis is desired in addition, put "99" in these columns. If not, leave blank.

R	36,37	Card output. If recap data is to be punched on cards, put "99" in these columns. If not, leave blank.
R	38,39	Copies of print-out. Put the number of print-outs desired of the "Meat Department Summary by Classes" and "Meat Department Operations Summary" in the space. Example: A "3" in Column 39 will yield 3 print-outs of each.
R	40-43	(F4.3) Shrinkage allowance. The program sums up the sales and profitability data for each item into a total department figure. This figure is computed without regard to probable shrinkage, except for that which may be provided for in the cutting tests. In addition, the user can read-in the percentage of total "computed sales" that he feels his company is achieving or that his company must achieve. For example, if the user believes average department shrinkage is 4.5%, then he would put ".955" in these columns. "Adjusted computed sales" will be calculated using this figure and compared with the actual cash register sales for the week.
NR	44-47	(F4.3) Allowance for personal and delay time. If the labor option is used, enter in these columns the percentage of "productive" man hours allowed for personal and delay time. Example: if 12 1/2% of total required time is expected to be used for personal and delay time, then put ".143" in the space provided. This figure is arrived at by dividing that part of total time which is "productive" (87.5%) into that part for personal and delay (12.5%) which equals 14.29%. See the aforementioned Research Bulletin No. 982 for a complete discussion and definition of "personal and delay time."
NR	48-54	(F7.2) Supply cost. If the labor option is being used and if supply costs are to be included in profit calculations, then put the dollar amount of supplies used during the data week in the space provided. Otherwise, leave blank.

R	Detail Card Deck--Unlimited number of cards. The program is designed to handle more than one card for each item number, as would be the case for more than one delivery of the item during the week.	
	Columns	
R	1	Put a "6" in Column 1 to indicate that the card contains delivery data. Place a blank card at the end of all detail cards to indicate end of record.
R	2,3,4,5	Item number. The identification number of the item delivered.
NR	6-10	Blank.
R	11,12,13,14	Units delivered. This space is for the delivery record, either in pounds or cases. If the latter is used for any item, the Week Number Card must contain "99" in Columns 9-10 and the corresponding inventory card a "2" in Column 72. When the above requirements have been met, the delivery data will be multiplied by the item's average weight so as to convert to pounds. NOTE: The detail cards may be in any order since the programs employ a binary search routine for matching numbers.
NR	Inventory Deck--Inventories may or may not be used; can be used for some but not all items. Only one inventory card allowed for each item.	
	Columns	
R	1	Put a "1" in Column 1 to indicate that the card contains inventory data. Place a blank card at the end of the inventory deck to signal the end of the record.
R	2,3,4,5	Item number of product inventoried.
NR	6-10	Blank.

R

Columns
11-14
15-18
19-22
.
.
.
67-70
} 15 weeks of inventories

The program is set up to handle 1 of 4 possible inventory cards for each item. Each card has space for 15 weeks of inventory data. The location of each week's inventory for one year is as follows:

Inventory Card No.	Weeks Represented														
1	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
3	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
4	42	43	44	45	46	47	48	49	50	51	52	(53)			

The week number(on Week Number Card) keys the location of the appropriate inventory values. The last inventory value on each card equals the first value on the next card since beginning and ending inventory values must be on one card.

R 71

Unit of measurement. The unit of measurement for the item inventoried is placed in Col. 71. If the inventory is taken in "pounds," a "1" is placed in this column. If a retail package count is used, a "2" is placed in this column. In the latter case, the beginning and ending inventories are multiplied by the average weight of the shipping unit divided by the number of selling units (consumer packages) in the shipping unit. A third alternative could be built into the program to handle situations where the inventory is taken by shipping units (whole cartons, etc.). In this case, the unit count would be multiplied by average weight per shipping unit to convert to pounds.

Note: The inventory cards do not need to be in any particular order.

NR Cutting Tests Deck--General Note: The cutting test module of this program adjusts the item retail price, based on the cutting test information, for a single store only. The retail price reverts back to its original value for calculations involving other stores. The Store Number Card provides the preliminary information necessary to exercise this option (see Store Number Card). The variable "ICUT 1" is the number of cutting

tests to be read by the computer. If the value is zero (or left blank), the program will skip over this module. "ICUT 2" represents the number of items with more than one cutting test. If more than one cutting test was read in for two items, ICUT 2 would equal 2. One of the main reasons for using two or more cutting tests for a single item is to calculate the effect on average retail price when this item is cut or merchandised more than one way; e.g., bone-in or boneless. The program provides for a weighting factor to be added to adjust for different sales distributions by cutting method for individual items. An example will be provided at the end of the card lay-out discussion for clarification.

R Number of Cuts Card -- First card in Cutting Test Deck

	Columns	
R	1,2	The number of retail cuts recorded from the first cutting test are entered in Cols. 1 and 2, the number of cuts for the second cutting test in Cols. 3 and 4, etc. The maximum number of cutting tests allowed is 20. The maximum number of cuts per cutting test is 20.
NR	3,4	
NR	.	
NR	.	
NR	.	
NR	39,40	

NR Combinations Cutting Test Card -- 1 only. Use only if any item has more than 1 cutting test.

	Columns	
R	1	The number of cutting tests to be combined for the first item are indicated in Col. 1, for the second item in Col. 2, etc. Up to 9 cutting tests can be combined for each item.
NR	2	
NR	3	
NR	.	
NR	.	
NR	.	
NR	10	Note: All multi-cutting test items must be read in before single test items.

R	Item Cutting Test Card -- 1 card for each item with a cutting test. This card immediately precedes the cutting test data card(s) for the same item. See Figure A-1.	
	Columns	
NR	1-5	For identification purposes--store number, etc .
R	6-9	Item Number.
R	10-12	(F3.2) Cutting test weights. These spaces are used for indicating the importance of each cutting test in the calculation of the item's average retail price. Up to 9 weights may be used for each item. The weights should reflect the proportion of the item cut and sold in different ways (either actual or desired). E.g., if two cutting methods are used for a particular item, and they are estimated to represent equal tonnages, then the two cutting tests would be weighted equally by entering 050050 in Cols. 10-15. The weights must sum to 1.00.
NR	13-15	
	.	
	.	
	.	
NR	34-36	
R	Cutting Test Data Card(s) -- First data card contains data for first 10 retail cuts of each cutting test; second data card can be used where more than 10 cuts result from a cutting tes	
	Columns	
NR	1-5	ID
R	6-9	(F4.0) Total Pounds of Item Used in Cutting Test
	10-13	(F4.0) Pounds of retail cut (A)
	14-16	(F3.2) Retail price of cut (A)
	17-20	(F4.0) Pounds of retail cut (B)
	21-23	(F3.2) Retail price of cut (B)
	.	The same format is followed for up to 10 cuts (through Col. 79). If the cutting test contains more than 10 cuts (20 is the maximum), a second data card using the same format as this one may be used. The first 9 columns should be skipped on card 2.
	.	
	.	
	73-76,77-79	

Cutting Test Example:

A store submits 3 cutting tests--2 of which are for the same item (No. 9305). The two cutting tests for No. 9305 are entered first; then the cutting test for item No. 5520. The information that would be needed is illustrated below:

	Cutting Test A	Cutting Test B	Cutting Test C
Item No.	9305	9305	5520
No. of Cuts	3	2	4
Total Pounds	40 lbs.	38 lbs.	75 lbs.
Retail Cut Info.	20 lbs. @ 1.29	30 lbs. @ 1.09	30 lbs. @ .69
	10 lbs. @ .99	5 lbs. @ .99	30 lbs. @ .79
	8 lbs. @ .69		5 lbs. @ .99
			3 lbs. @ 1.59
Tonnage Distribution	65%	35%	100%

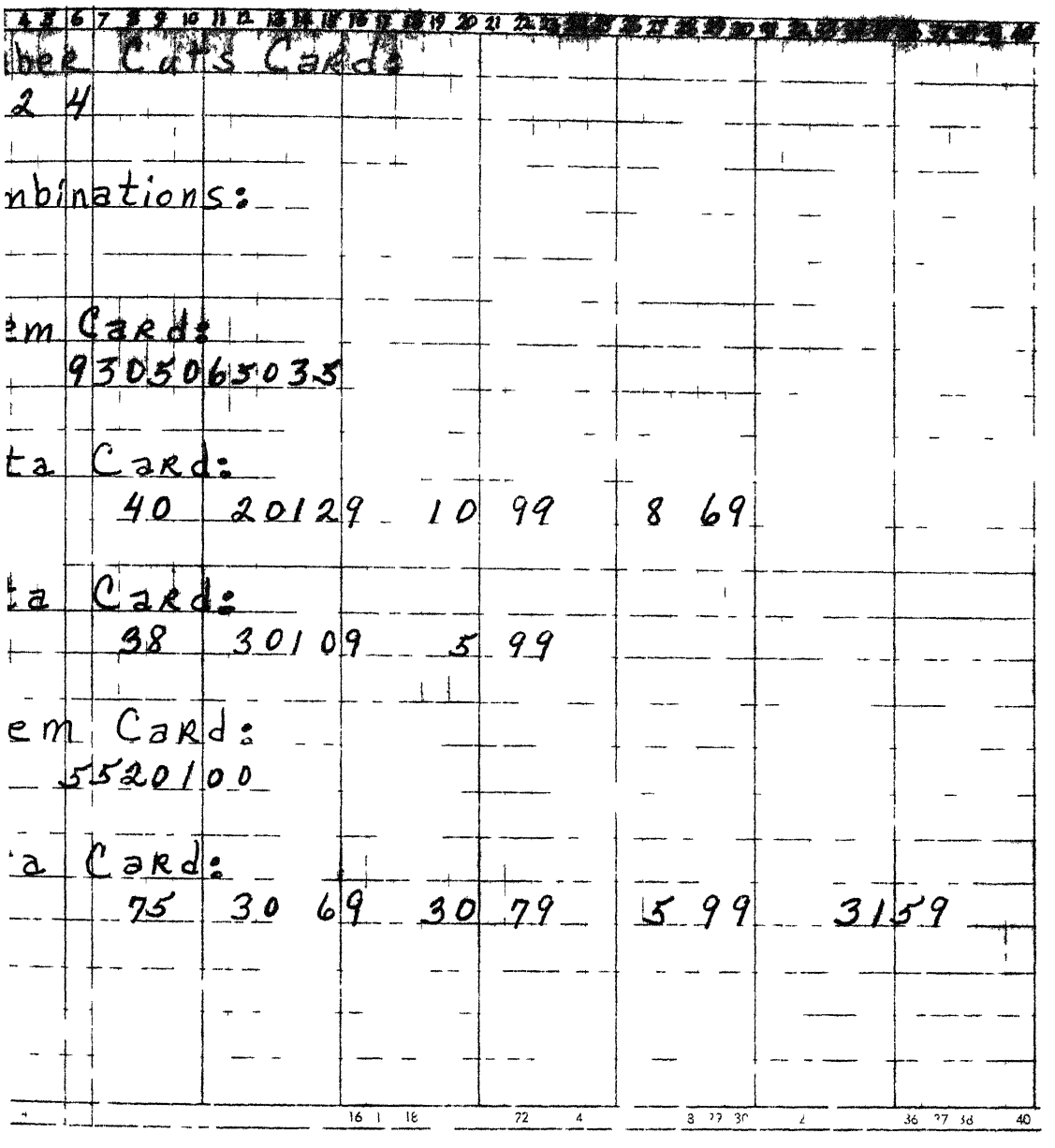
NOTE: Retail cut poundage does not sum to total poundage because of waste and unsaleable parts.

Values of ICUT 1 = 3
Values of ICUT 2 = 1

Store No. Card Contains a 3 in Column 27 and a 1 in Column 29.

Cutting Test Deck would look as shown in Figure 1.

Figure 1


ber Cats Cards
2 4
nbinations:
m Card:
930506035
ta Card:
40 20129 10 99 8 69
ta Card:
38 30109 5 99
em Card:
5520100
a Card:
75 30 69 30 79 5 99 3159

NR Labor Data Deck--Only 1 card per class.

The program will compute direct labor requirements by class if the user supplies the appropriate coefficients. The coefficients may contain both fixed and variable components as long as they are linear in nature. E.g., if hours of labor = a + bX, coefficients for (a) and (b) can be read into the program. The labor requirements are divided into five activity categories. Indirect labor coefficients are built into the program (based upon Research Bulletin 982, previously cited). Personal and delay time is estimated by the user on the Store Number Card. The coefficients incorporated in the program are as follows:

Indirect Labor Coefficients Built-into Program	Man - Hours		
	a	+	bX
Activity	Fixed Per Week		Variable per $100 Sales
Reconditioning	2.65		.02
Receiving	.75		.05
Clean-up	5.84		.11
Supervision	5.37		.03
Administration	2.87		.05
Set-up and Miscellaneous	19.48		*
Customer Service	.90		6.80 **

* No relationship was reported found between hours required and departmental sales.

** Volume measured in 100 customer service transactions.

Important Note: While indirect labor is computed on the basis of dollar sales, the direct labor requirements are computed on the basis of class pounds sold.

Direct Labor Card:

	Columns	
NR	1-8	ID
R	9,10	Class Number. Remember that the program assumes that the first Class Name Card is Class No. 1, the second Class Name Card is Class No. 2, etc.

Columns

	Fixed (a)		Variable (bX)	
NR	11 12 ^ 13 14	+	15 ^ 16 17 18	Processing Labor
	19 20 ^ 21 22		23 ^ 24 25 26	Traying Labor
	27 28 ^ 29 30		31 ^ 32 33 34	Packaging Labor
	35 36 ^ 37 38		39 ^ 40 41 42	Pricing Labor
	43 44 ^ 45 46		47 ^ 48 49 50	Stocking Labor

The fixed values for labor are placed in the first set of columns, and the variable values in the second set of columns.

The accompanying print-out indicates the form of output.

Data Checks & Automatic Operations

The program contains a series of data checking modules. Some of these are automatic and others must be asked for on the Store Number Card. Any item in the Master Deck which includes a "Pack" value (Columns 6-8) of "zero" automatically has this changed to "1". The program will automatically print out in the output any Detail or Inventory cards which cannot be traced to an item number in the Master Deck as follows:

"Error---Detail (card) But No Master Item Number XXXX"
"Error---Inventory " " " " " " "

If "99" is put in Columns 22 and 23 of the Store Number Card the following additional error messages will be printed out when appropriate:

"No Retail Price for XXXX (item number)"
"No Average Cost for XXXX"
"No Average Weight for XXXX"
"No Class ID for XXXX"
"Detail but No Inventory for XXXX"

In addition, whenever the user specifies an inventory or output combination--the data for the individual items making up the combination is printed immediately following the error message.

Produce Recap Program

The Produce Recap Program was written as a corollary to the Meat Recap Program. The two programs are almost identical except for the labor requirements module. While the meat program incorporates this module, the Produce Program was built around the labor standards work of the U. S. Department of Agriculture. However, this module is still presented as an option, and the produce program will function much the same as the meat program if this option is not used.

A second difference between the program concerns the unit of sale. While the meat program uses "pounds sold," the produce program uses "cases sold." This is due to the heterogeneous manner in which produce is commonly sold. A produce "case" refers to the wholesale shipping unit which is specified in the Master Deck.

Required Order, Description, and Definition of Input

R Week Number Card -- 1 card only

	Columns	
R	1,2	Number of Week
NR	3,4	Number of Inventory Combinations Desired.
NR	5,6	Number of Output combinations desired.
NR	7,8	Number of features to be printed.
NR	9,10	Labor data in this program is treated on a per item basis. Also, whereas in the meat program, labor data is read in on a store-by-store basis, in this program it is read-in once for all stores being processed. If labor data is desired, put "99" in the space, if not, leave blank.
	11-62	Not used.
NR	63-80	Calendar date.

R Class Name Deck -- Must be 9 classes. Uses USDA classification.

Same format as used in meat program.

NR Features Deck -- Same number of cards as number of features.

Same format as used in meat program.

NR Inventory Combinations Deck -- Same number of cards as number of inventory combinations + 1.

Same format as used in meat program.

NR Output Combinations Deck --Same number of cards as number of output combinations + 1.

Same format as used in meat program.

NR Labor Deck -- Not more than 1 card per item number.

The labor section of this program was developed to use the U. S. D.A. produce coefficients. These coefficients were developed for many different work categories and methods. Basically the user is asked to select the appropriate coefficients from the tables (or supply his own). Occasionally the coefficient to be punched on the card will involve the summation of several U.S.D.A. coefficients. The U.S.D.A. work categories were organized for this program in the following way:

I. Direct Labor -- computed by item

A. Backroom production

1. Trimming

a. Trim coefficient

b. Trim handle coefficient

2. Pricing

a. Pricing coefficient

3. Packaging

   a. Backroom production coefficient

   b. Backroom production handling

      Backroom travel
      Open container
      Break and dispose of container

      } Separate coefficients are summed together to form 1 coefficient

B. Display and customer service

   1. Customer service

      a. Customer service coefficient

   2. Display

      a. Display
         Police and Rotate } separate coefficients are summed

      b. Display travel
         Display handle } separate coefficients are summed

C. Recondition and Redisplay

   1. Recondition, repackage, and reprice

      a. Retrim coefficient

      b. Retrim handle
         Redisplay production
         Redisplay price
         Discount handle

         } This value is automatically computed from coefficients entered by the user and those already in program.

   2. Redisplay

      a. Redisplay
         Redisplay travel
         Repolice and rotate
         Redisplay handle

         } This value is automatically computed from coefficients entered by the user and those already in program.

II. Indirect Labor -- computed for department

A. Set-up and Take Down

a. Value is given for each store by user on Store Number Card

B. Management

a. Computed automatically in program

C. Receiving

a. Receiving Coefficient--computed by item but only used in department summary

D. Salvage and Clean-up

a. Salvage and Clean-up Coefficient--computed by item but only used in department summary.

III. Personal and Delay Time

1. Personal and Delay percentage of total time is supplied by user on Store Number Card

The user must supply all values listed below for labor option to function accurately.

Columns

1	ID -- Leave blank--except place a "9" in space provided to indicate last card in deck.
2-5	Item Number associated with data on card.
6-10	(F5.3) Average C.P.U.--from USDA tables
11-15	(F5.3) C.P.U. per display container--from USDA tables
16-20	(F5.3) % Discount--from USDA tables
21-25	(F5.3) % Throwout--from USDA tables

Columns	
26-30	(F5.3) Display-Police-Rotate Coefficient-from USDA tables
31-35	(F5.3) Display Handle + Display Travel Coefficient--from USDA tables
36-40	(F5.3) Trim Coefficient--from USDA tables
41-45	(F5.3) Trim Handle Coefficient--from USDA tables
46-50	(F5.3) Retrim Coefficient -- from USDA tables
51-55	(F5.3) Backroom Production Coefficient--from USDA tables
56-60	(F5.3) Pricing Coefficient--from USDA tables
61-65	(F5.3) Backroom Production Handle + Backroom Travel + Open Container + Break & Dispose Container Coefficient--from U.S.D.A. tables
66-70	(F5.3) Receiving Coefficient--from U.S.D.A. tables
71	Customer Service ID "0" = No customer service "1" = Special weigh station "2" = Weigh at check out
72-76	(F5.3) Salvage Coefficient from tables

Note: If the labor option is used an automatic "shrinkage value" is produced based on estimated product loss.

R Master Deck -- Any number of cards (1 per item) up to 300. Card item numbers must be in ascending order.

	Columns	
R	1	ID--leave blank except for last card in deck. Put a "9" in Column 1 of last card to signal end of Master Deck.
R	2-5	Item Number--This program differs from Meat Program in that the first digit (Column 2) indicates the class number.
R	6-10	(F 5.0) Retail Pack or Number of selling units.
R	11-28	Name of item
R	29-33	(F5.4) Retail Price per selling unit
R	34-38	(F5.4) Cost per Case

Note: This program allows for additional Master Deck cards and labor data to be submitted at the end of the individual store data to reflect differences among stores in merchandising units and methods. (See Additional Master and Labor Cards section).

R Store Number Card -- 1 only

	Columns	
R	1,2	Number of store associated with following data
R	3-11	(F9.2) Dollar amount of cash register sales
NR	12-17	(F6.1) Actual number of labor hours used
NR	18-21	(F4.2) Average wage rate
R	22,23	Data Deck. The program will check for the completeness of data if "99" is put in these columns. If not desired--leave blank.
R	24,25	Labor Option--Unlike the meat program where the number of labor cards to be read-in was necessary for labor computations--simply put "99" in these columns if this option is desired; if not, leave blank.

R	26,27	The number of "additional" Master Cards for this store which are to be read-in. (See Additional Master Card section)
R	28,29	Item analysis--if an item by item analysis is desired, "99" is entered in these columns; otherwise leave blank
R	30,31	Punched output--if the punched output is desired--put "99" in these columns
R	32,33	Number of copies of department summaries desired
R	34-37	(F4.3) This space is for the adjustment factor (shrinkage estimate) for calculating computed sales (the labor option automatically produces a shrinkage estimate for product loss). Estimated shrinkage is entered as a decimal--not in percentage form. E.g., if shrinkage is estimated to be 6%, 0006 is entered on card.
NR	38-41	(F4.3) Personal and delay time--When the labor option is being used, the percentage of "productive" man hours allowed for personal and delay time is entered here. E.g., if 15% is allowed, 0176 would be entered in the space provided. (See Meat Program Store Number Card for calculation.)
NR	42-45	(F4.2) Set-up and take down time--When the labor option is being used, enter the estimated number of hours used in setting up and taking down the department displays.
NR	46-52	(F7.2) Supply Cost--If the labor option is being used, the dollar amount of supplies used during the data week are entered.

R	Detail Deck --	Unlimited number of cards in any order. Delivery data must be in cases or units that are consistent with the information on the Master Cards.
	Columns	
R	1	"6" for ID. Put a blank card at end of deck to signal end of deck.
R	2-5	Item number
R	6-10	(F5.0) Number of cases delivered
NR	Inventory Deck	--Any number of cards up to 1 for each item. No order implied.
	Columns	
R	1	"1" for I.D. Put a blank card at end of deck to signal end of deck.
R	2-5	Item Number
NR	6-9	Blank
R	10-13	(F4.0) Space is provided for 15 weekly inventories
	14-17	(F4.0) on a card. (See Meat Program Inventory
	.	Deck description). Inventories may be
	.	in cases or retail selling units. If the
	.	former is used--put "1" in Column 70.
	66-69	(F4.0) If the latter, put "2" in Column 70.
R	70	

Additional Store Master and Labor Cards

These cards are placed at the end of the data for an individual store. They are used only where an individual warehouse item is merchandised in more than one form at store level. E.g., watermelons may be sold whole, in halves and in quarters. The additional master and labor cards are used if a more accurate computation of sales and labor are desired in such situations.

The additional master cards follow the same format as given earlier except that an additional weight factor is needed to indicate how much of the total sold was accounted for by this latter method. In Columns 39-41 (F3.2) place the weight assigned to this method. If the store being processed is using the labor option, then a labor data card is required immediately after each additional master card. Any number of additional master cards is acceptable as long as the 300 maximum is not reached. The program treats this data separately from the original master item and both will be printed out.

Card Order for Two Programs

Meat Program

1. Week Number Card
2. Class Name Deck
3. Features Deck
4. Inventory Combinations Deck
5. Output Combinations Deck
6. Master Deck
7. Store Number Card
8. Detail Deck
9. Inventory Deck
10. Cutting Test Deck
    a. No. of Cuts Card
    b. Combinations Cutting Test Card
    c. Item Cutting Test Card
    d. Cutting Test Data Cards
11. Labor Data Deck

Produce Program

1. Week Number Card
2. Class Name Deck
3. Features Deck
4. Inventory Combinations Deck
5. Output Combinations Deck
6. Labor Deck
7. Master Deck
8. Store Number Card
9. Detail Deck
10. Inventory Deck
11. Additional Master and Labor Cards

NOTE: Input items 1-6 for the meat program, and 1-7 for the produce program are read in only once, regardless of the number of individual stores processed. The remaining input pertains to individual stores and is repeated for each store processed.

FIGURE 2: Card Formats for Input to OARDC Meat Program

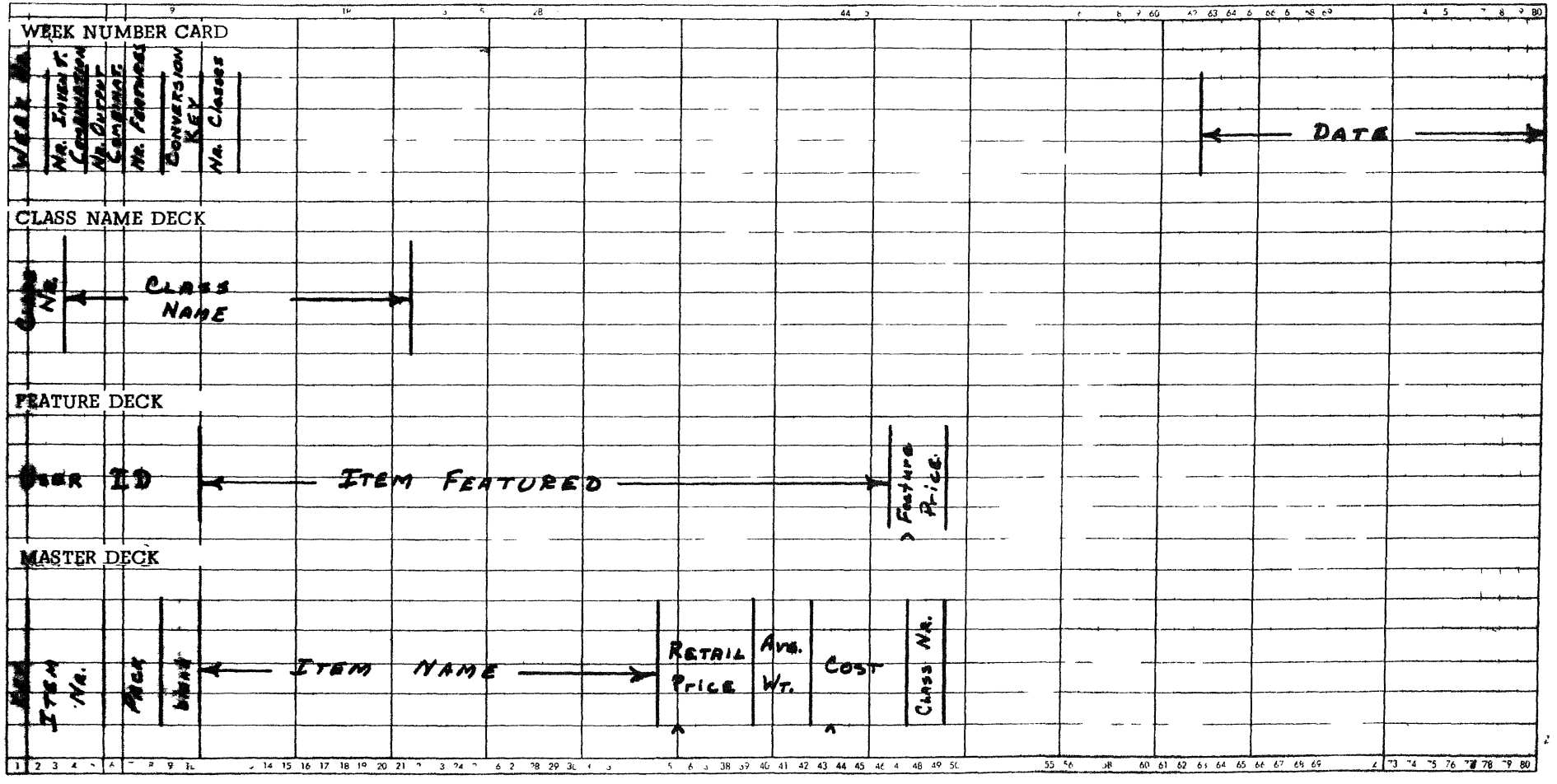


FIGURE 2: Card Formats for Input to OARDC Meat Program (continued)

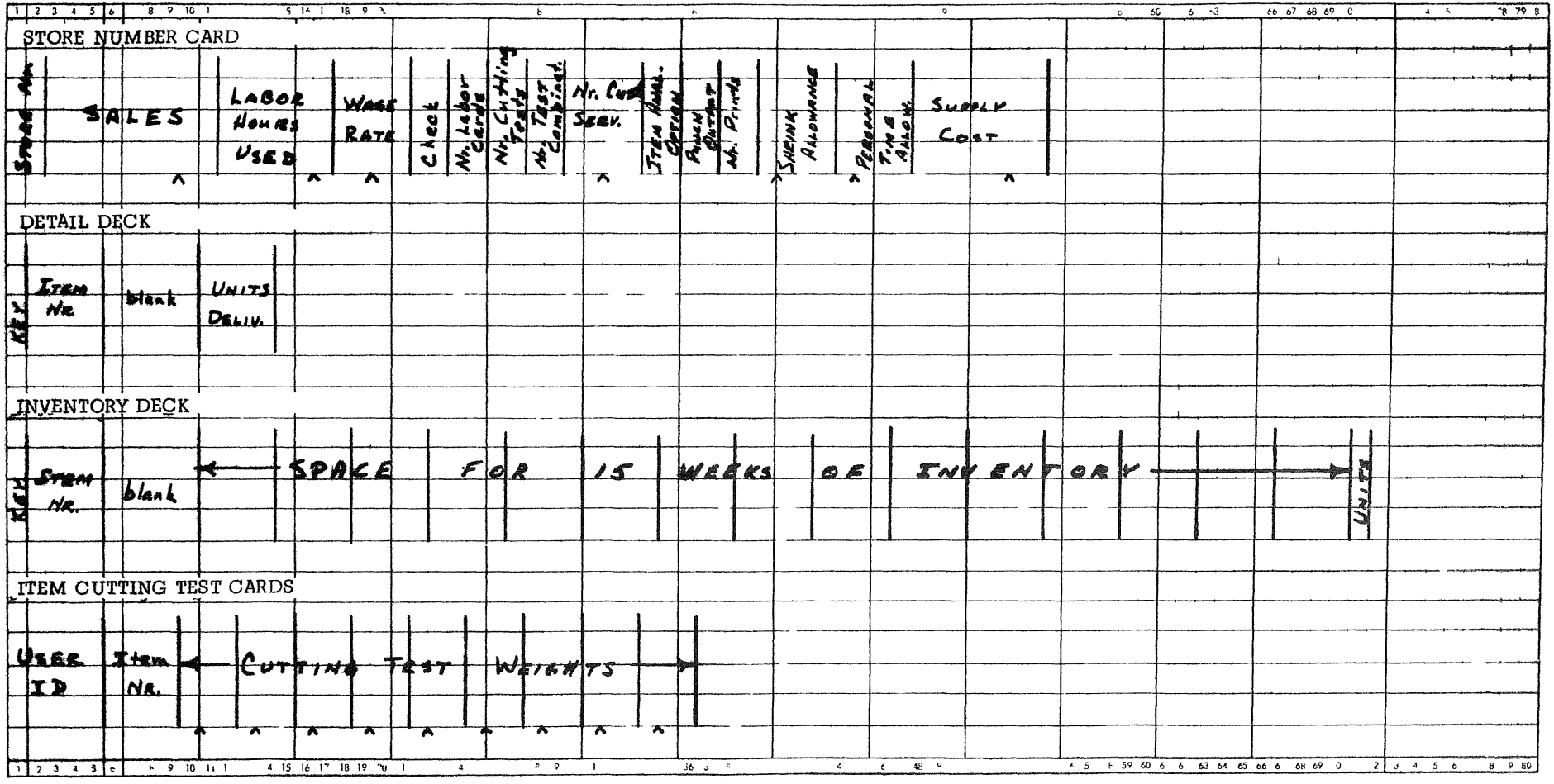


FIGURE 2: Card Formats for Input to OARDC Meat Program (continued)

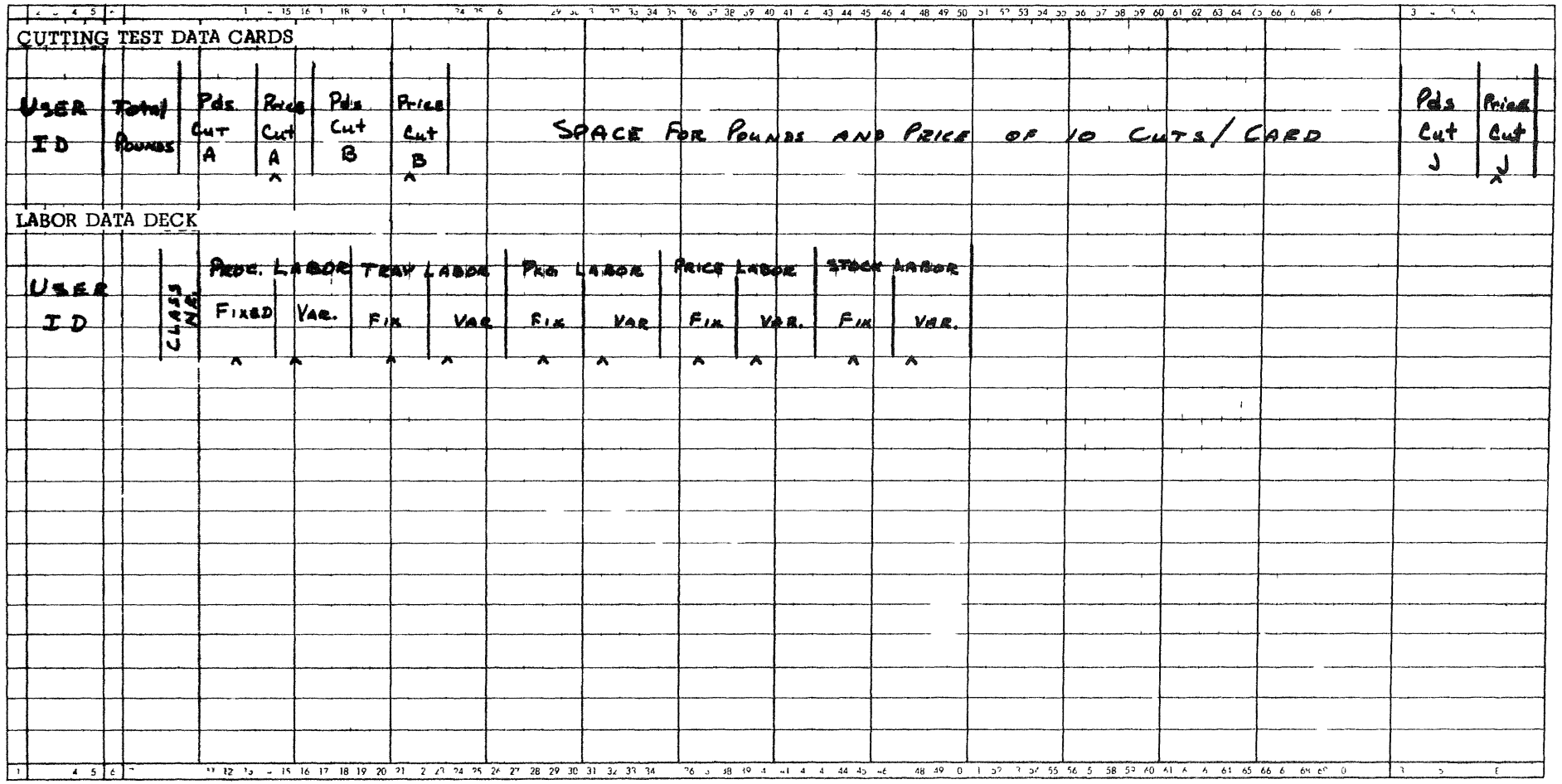


FIGURE 3: Card Formats for Input to OARDC Produce System

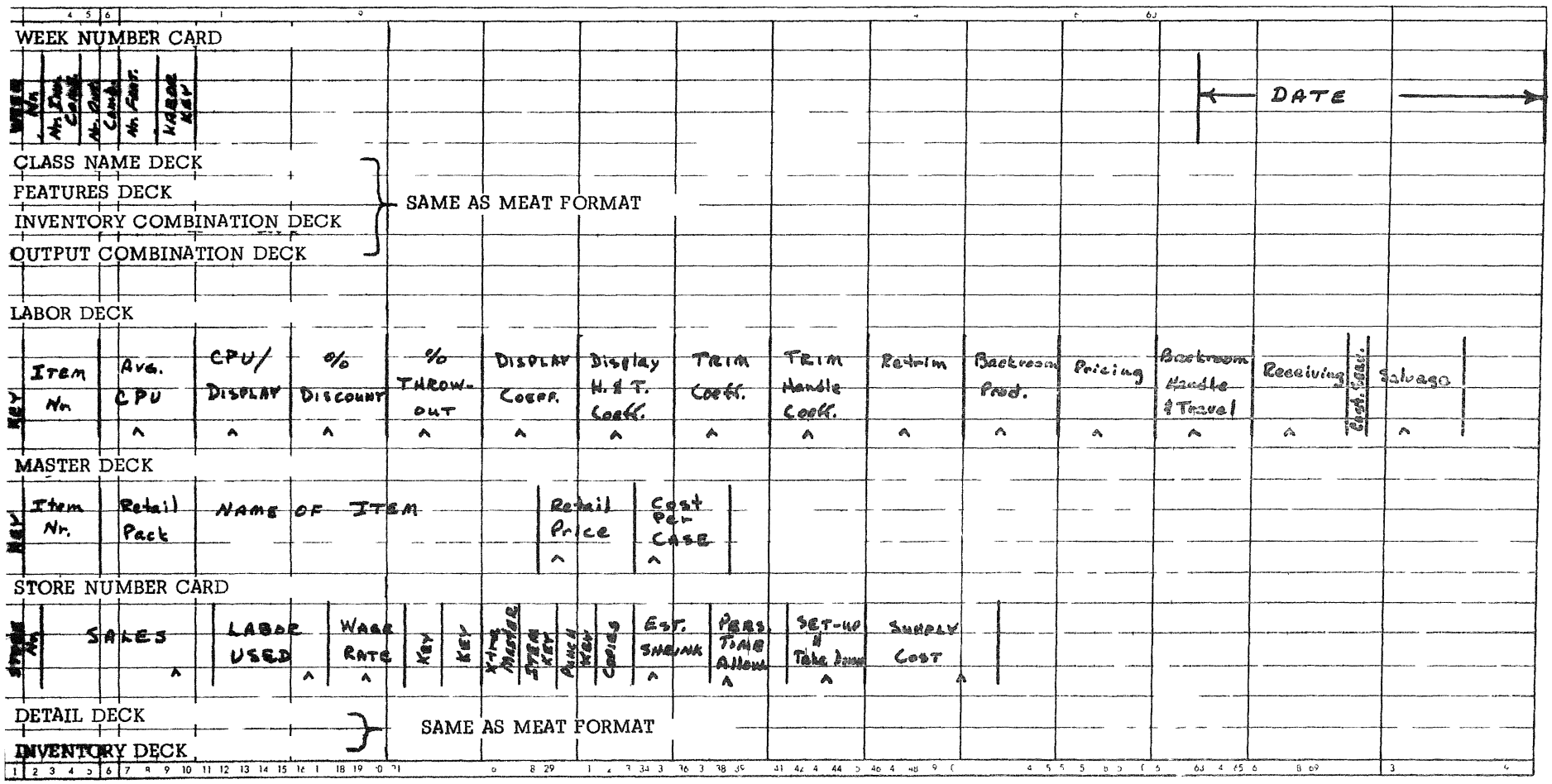


FIGURE 4: Example of Data Deck for Meat Program

```
     *WEEK NUMBER CARD
 1 1 1 5  10
     *CLASS NAME DECK
 1 BEEF RIBS
 2 BEEF LOINS
 3 BEEF ROUNDS
 4 BEEF CHUCKS
 5 BEEF MISC.
 6 PORK LOINS
 7 SMOKED PORK
 8 BACON AND WEINERS
 9 POULTRY
10 MISC. MEATS
     *FEATURES DECK
01   1      XXX ROUND STEAK                          109
02   1      XXX WHOLE FRYERS                          29
03   1       XX LOIN PORK CHOPS                      119
04   1       XX 1LB. BACON KAHN                       99
05   1        X GROUND BEEF                           75
     *INVENTORY COMBINATIONS DECK
2
21052109
     *OUTPUT COMBINATIONS DECK
2
31043109
     *MASTER DECK
 1010   1  RIBS                          7000 26 5100 1
 1020   1  TRIMMED LOINS                  7640 42 6000 2
 1030   1  SHORT LOINS                   11000 35 9000 2
 1040   1  ROUNDS                     SP  6250 20 4800 3
 1050   1  CHUCKS                         4275 96 3150 4
 1060   1  BEEF KIDNEYS                   2700  5 1200 5
 1070   1  BEEF LIVER                     5550 11 3242 5
 1080   1  BEEF HEARTS                    4500  4 3294 5
 2105   6  PORK LOINS 8-14LB.         SP  6080 69 5026 6
 2109   5  PORK LOINS 12-16LB.        SP  6080 69 5011 6
 2150   4  HARVEST HAMS 10-12LB.          8900 45 7100 7
 2175   5  HARVEST PNLS HAMS              9500 51 7817 7
 3010  12  KAHN BACON 1LB.            SP  9900 12 7500 8
 3020  12  KAHN WEINERS 1LB.              6900 12 5289 8
 3104  10  WHOLE FRYERS BAGGED        SP  2900 30 2500 9
 3109  10  WHOLE FRYERS               SP  2900 30 2400 9
 3150   6  OYSTERS STD 8OZ.              13800  3 956010
 3170   6  OYSTERS STD 12OZ.              9900  5 820510
     *STORE NUMBER CARD
 5   129545   405 150 910 3 1 68 9999 2.955.143    2500
     *DETAIL DECK
61010       60
61010      150
61010       96
61020       85
61030       70
61020       65
61030      100
61040      200
61050      180
```

* Refers to headings inserted for user information and are not part of data decks to be submitted for processing.

FIGURE 4: Example of Data Deck for Meat Program (continued)

```
62150         90
62175        100
62175         49
63010         24
63020         36
63104         90
63109         62
63104        110
63109         68
63150          6
63170         10
     **BLANK CARD
      *INVENTORY DECK
13170         10    5
11010        100   50
11020         50  100
11030         75   75
11040        150  100
11050        100  120
11060         20   15
11070          5    5
11080         10
12105        130  100
12109        150  170
12150        400  375
12175        200  225
13010         30   27
13020         70   80
13109        140  100
13150          3    3
     **BLANK CARD
      *CUTTING TEST DECK
 3 2 4
2
CUT1 1020065035
CUT11  40  20129   10 99    8 69
CUT12  38  30109    5 99
CUT2 1010100
CUT21  75  30 69   30 79    5 99    3159
      *LABOR DECK
LABOR     1 1     1  1     1  1     1  1     1  1     1
LABOR     2 1     1  1     1  1     1  1     1  1     1
LABOR     3 1     1  1     1  1     1  1     1  1     1
LABOR     4 1     1  1     1  1     1  1     1  1     1
LABOR     5 1     1  1     1  1     1  1     1  1     1
LABOR     6 1     1  1     1  1     1  1     1  1     1
LABOR     7 1     1  1     1  1     1  1     1  1     1
LABOR     8 1     1  1     1  1     1  1     1  1     1
LABOR     9 1     1  1     1  1     1  1     1  1     1
LABOR    10 1     1  1     1  1     1  1     1  1     1
      *STORE NUMBER CARD
 9    129545   405 150990      68 9999 2,955,143   2500
      *DETAIL DECK
60010         60
61010        150
61010         96
```

* Refers to headings inserted for user information and are not part of data decks to be submitted for processing.

** Refers to cards which are to be inserted to indicate the end of certain data decks (See write-up).

Start of data for second store

SECTION 2

COMPUTER PROGRAM

for

OARDC MEAT SYSTEM

Program for O.A.R.D.C. Meat System
Fortran IV

(For card handling only)

```
   DIMENSION DATE%3<,CLASS%30,3<,FEATUR%40,7<,IB%25<,ITINCO%100<,JB%2      00000
  15<,ITOPCO%100<,KCOUNT%15<,ITEMNR%425<,PACK%425<,NAME%425,4<,BPRICE      00050
  2%425<,AVEWT%425<,AVECST%425< ,ICLASS%425<,PDSDEL%425<,DIFINV%425<,      00100
  3AVEINV%425<,ICOVRT%425<,ACTINV%15<,UNITSO%425<,SALES%425<,DOGRMG%4      00150
  425<,KB%20<,ITCO%20<,WTTEST%10<,INFO%20<,PINFO%20<,CWT%20<,CPRICE%2      00200
  50<,CLUNSD%30<,CLSALE%30<,CLAVIN%30<,CLDOGM%30<,CLPCGM%30<,TCLLAB%3      00250
  60<,PROLAB%30<,TRALAB%30<,PACLAB%30<,PRILAB%30<,STOLAB%30<,PCDCP%30      00300
  7<,DLABOR%30<,DOLDCP%30<,CLINTN%30<                                      00350
    INTEGER CASELD,STORNR,CLASNR%30<,DETAIL                                00500
    REAL INTURN,MISC,INDCT1,INDCT2                                         00550
    DATA ISUM,JJ,IJ,KCOUNT,CLASNR,T/2*0,2*1,2,3,4,5,6,7,8,9,10,11,12,1     00600
   13,14,15,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,2     00650
   23,24,25,26,27,28,29,30,100./                                           00700
  9 FORMAT %//60X,26H**************************/60X,1H*,24X,1H*/60X,26     00750
   1H*     LLOYD T. BAY        */60X,26H*   MEAT RECAP PROGRAM   */60X     00800
   226H*    REVISED 11/ 4/70    */60X,1H*,24X,1H*/60X,26H*************      00850
   3***********/1H1<                                                       00900
 19 FORMAT %6I2,50X,3A6<                                                  00950
 29 FORMAT %3X,3A6<                                                       01000
 39 FORMAT %10X,6A6,F3.2<                                                 01050
 49 FORMAT %25I1<                                                         01100
 59 FORMAT%10I4<                                                          01150
 69 FORMAT %I1,I4,F3.0,2X,4A6,F5.4,F3.0,F5.4,I2<                          01200
 79 FORMAT %I2,F9.2,F6.1,F4.2,4I2,F4.2,3I2,2F4.2,F7.2<                    01250
 89 FORMAT %I1,I4,5X,I4<                                                  01300
 99 FORMAT %1H ,43HERROR------DETAIL BUT NO MASTER ITEM NUMBER I5,10X,1   01350
   19HPOUNDS DELIVERED # I4,10X,16HIDENTIFICATION  I1<                    01400
109 FORMAT %I1,I4,5X,15F4.0,I1<                                           01450
119 FORMAT %1H ,43HERROR------INV.   BUT NO MASTER ITEM NUMBER I5,43X,1   01500
   16HIDENTIFICATION  I1<                                                 01550
129 FORMAT %1H1//41X,37HDETAILED LISTING OF MISSING ITEM DATA<            01600
139 FORMAT %1H 22HNO RETAIL PRICE   FOR I4<                              01650
149 FORMAT %1H 22HNO AVERAGE COST   FOR I4<                              01700
159 FORMAT %1H 22HNO AVERAGE WEIGHT FOR I4<                              01750
169 FORMAT %1H 22HNO CLASS I.D.     FOR I4<                              01800
179 FORMAT %1H 30X,22HNO INVENTORY CARD FOR I4<                          01850
189 FORMAT %1H 60X,19HNO DETAIL CARD FOR I4<                             01900
199 FORMAT %1H 90X,23HDETAIL BUT NO INV. FOR I4<                         01950
209 FORMAT %1H1,//39X,42HDETAILED LISTING OF INVENTORY COMBINATIONS//<   02000
219 FORMAT %1H011HITEM NUMBERI5,26H WITH A DIFFERENCE IN INVENTORIES O   02050
   1FF5.0,24H ,IS BEING COMBINED INTOI5,1H,/25H TOTAL CARRIED FORWARD     02100
   2ISF5.0,10X,31HNAME OF ITEM BEING COMBINED IS 4A6,1H.<                 02150
229 FORMAT %1H011HITEM NUMBERI5,3H ,%4A6,52H<, NOW HOLDS CUMULATIVE DI   02200
   1FFERENCE IN INVENTORIES OFF5.0/////<                                  02250
239 FORMAT %1H1,//40X,39HDETAILED LISTING OF OUTPUT COMBINATIONS//<       02300
249 FORMAT %1H011HITEM NUMBERI5,32H WITH SALES#F8.2,18H POUNDS DELIVER   02350
   1ED#F5.0,21H DOLLAR GROSS MARGIN#F7.2,16H AND UNITS SOLD#F7.0/5X,23     02400
   2H,IS BEING COMBINED INTOI5/10X,20HTOTALS CARRIED FORWARD--SALES#F8     02450
   3.2,5X,17HPOUNDS DELIVERED#F5.0,5X,20HDOLLAR GROSS MARGIN#F7.2/5X,1     02500
   45HAND UNITS SOLD#F7.0/33H NAME OF ITEM BEING COMBINED IS  4A6<         02550
259 FORMAT %1H011HITEM NUMBERI5,2H, 4A6,35HNOW HOLDS CUMULATIVE VALUES   02600
   1--SALES F8.2,5X,17HPOUNDS DELIVERED#F5.0/5X,20HDOLLAR GROSS MARGIN    02650
   2#F7.2,5X,15HAND UNITS SOLD#F7.0/////<                                 02700
269 FORMAT %20I2<                                                         02750
279 FORMAT %5X,I4,10F8.2<                                                 02800
```

```
289 FORMAT %5X,F4.0,10%F4.0,F5.2</9X,10%F4.0,F5.2<<                    02850
299 FORMAT %8X,I2,5%F4.2,F4.3<<                                        02900
309 FORMAT %1H1143X,27HSALES ANALYSIS   MEAT DEPT./48X,6HSTORE I2,2X,7H 02950
   1WEEK---I2,10X,15HFOR WEEK ENDING5X,3A6///46X,26HLIST OF FEATURES F  03000
   2OR WEEK-I2/<                                                       03050
319 FORMAT %2%12X,6A6,1H$F4.2<<                                        03100
329 FORMAT %///120H ------------------------------------------------    03150
   1----------------------------------------------------------------    03200
   2---/106X,11HPER CENT OF/1H I2,2X,3A6,7X,4HLBS.4X,4HINV.3X,6HRETAIL  03250
   35X,5HSALES3X,6HDOLLAR4X,4HPCT.4X,5HLABOR3X,7HD.CLASS3X,4HPCT.2X,12  03300
   4HCLASS TOTALS/30X,4HSOLD4X,4HTURN3X,5HPRICE6X,5HVALUE3X,6HGR.MG.4X  03350
   5,4HGRMG4X,4HCOST4X,6HPROFIT4X,3HDCP3X,5HSALES4X,4HGRMG/120H ------  03400
   6----------------------------------------------------------------    03450
   7----------------------------------------------------------<         03500
339 FORMAT %4X,4A6,F7.0,F7.1,F9.4,F10.2,F9.2,F8.2,25X,2F8.2<            03550
349 FORMAT %4X,4A6,F7.0,4X,3HNI F9.4,F10.2,F9.2,F8.2,25X,2F8.2<        03600
359 FORMAT %/6X,5HTOTAL17X,F7.0,F7.1,9X,F10.2,F9.2,F8.2,2F9.2,F8.2,F5.  03650
   10,F8.0<                                                            03700
369 FORMAT %1H 10HITEM ST.WK26X,35HLBS.  RETAIL  SALES   GR.  CL  LBS.  03750
   1/11H  NR. NR.NR26X,35HSOLD  PRICE   VALUE   MG.      DEL./72H ----  03800
   2----------------------------------------------------------------    03850
   3-<                                                                 03900
379 FORMAT %1H ,I4,2I3,4A6,F6.0,F8.0,2F7.2,I3,F6.0<                    03950
389 FORMAT %1H ,4X,2I3,3A6,6X,F6.0,8X,2F7.2,I3<                        04000
399 FORMAT %1H1/43X,34HMEAT DEPARTMENT SUMMARY BY CLASSES//48X,6HSTORE  04050
   1 I2,9H  WEEK---I2,13X,15HFOR WEEK ENDING5X,3A6///120H ------------  04100
   2----------------------------------------------------------------    04150
   3-----------------------------------------------/83X,26HPER CENT  OF  DEP  04200
   4T. TOTALS/28X,4HLBS.4X,4HINV.4X,5HSALES4X,6HDOLLAR4X,4HPCT.3X,7HD.  04250
   5CLASS3X,4HPCT.4X,4HLBS.11X,14HGROSS  D.CLASS /28X,4HSOLD4X,4HTURN4  04300
   6X,5HVALUE4X,6HGR.MG.4X,4HGRMG3X,6HPROFIT4X,3HDCP5X,4HSOLD3X,21HSAL  04350
   7ES  MARGIN  PROFIT   /120H ----------------------------------------  04400
   8----------------------------------------------------------------    04450
   9---------------<                                                   04500
409 FORMAT %4X,3A6,F11.0,F7.1,F10.2,2%F9.2,F8.2<,4F8.2<                04550
419 FORMAT %/4X,11HDEPT. TOTAL7X,F11.0,F7.1,F10.2,2%F9.2,F8.2<,F6.0,3F  04600
   18.0/120H ------------------------------------------------------    04650
   2----------------------------------------------------------///4      04700
   36X,26HLIST OF FEATURES FOR WEEK-I2/<                               04750
429 FORMAT %1H1///42X,34HMEAT DEPARTMENT OPERATIONS SUMMARY//46X,5HSTO  04800
   1REI3,10X,6HWEEK--I2,8X,15HFOR WEEK ENDING5X,3A6////48X,8HADJUSTED   04850
   216X,24HACTUAL MINUS    PER CENT/38X,59HCOMPUTED  COMPUTED    ACTUA  04900
   3L   ADJUSTED COMPUTED  VARIATION     /30X,5HSALESF11.2,F10.2,F11.2  04950
   4,F13.2,F15.2//23X,12HGROSS MARGINF11.2,F10.2,F11.2,F13.2,F15.2//23  05000
   5X,13HPER CENT G.M.2F10.2,F11.2,F13.2<                              05050
439 FORMAT %/////54X,13HLABOR RESULTS//7X,12HDIRECT LABOR9X,5HHOURS3X   05100
   1,7HT.HOURS4X,5HWAGES34X,13HLABOR SUMMARY/10X,10HPROCESSINGF13.1/10  05150
   2X,7HTRAYING3X,F13.1/10X,9HPACKAGINGF14.1,51X,8HADJUSTED16X,8HPER C  05200
   3ENT/10X,7HPRICING3X,F13.1,51X,8HCOMPUTED6X,6HACTUAL4X,9HVARIATION/  05250
   410X,8HSTOCKINGF15.1,F10.1,2X,1H$F7.2,25X,5HSALESF9.2,F13.2,F10.2//  05300
   57X,14HINDIRECT LABOR50X,12HGROSS MARGINF9.2,F13.2,F10.2/10X,14HREC  05350
   6ONDITIONINGF9.1/10X,9HRECEIVINGF14.1,21X,19HDIRECT CLASS PROFITF9.  05400
   72,F13.2,F10.2/10X,7HCLEANUP3X,F13.1/10X,11HSUPERVISIONF12.1,38X,12  05450
   8HPER CENT DCPF9.2,F13.2/10X,14HADMINISTRATIONF9.1/10X,16HSET-UP AN  05500
   9D MISC.F7.1,39X,11HTOTAL HOURSF8.1,F13.1,F11.2/10X,16HCUSTOMER SER  05550
   AVICEF7.1,F10.1,3H  $F7.2/72X,11HTOTAL WAGESF9.2,F13.2/7X,18HPERSON  05600
```

```
   BAL AND DELAYF8.1,F10.1,3H  $F7.2/65X,18HSALES PER MAN HOURF9.2,F13     05650
   C.2/15X,6HTOTALS12X,F10.1,3H  $F7.2/64X,19HGR.MG. PER MAN HOURF9.2,     05700
   DF13.2//64X,19HD.C.P. PER MAN HOURF9.2,F13.2//29X,14HTOTAL SUPPLIES     05750
   E3H  $F7.2,7X,24HPAYROLL AS PCT. OF SALESF8.2,F13.2//59X,25HSUPPLIE     05800
   FS AS PCT. OF SALESF8.2,F13.2<                                          05850
99 FORMAT %1H1<                                                           05870
   WRITE %6,9<                                                            05900
   READ %5,19< NRWEEK,NRINCO,NROPCO,NRFEAT,CASELD,NRCLAS,%DATE%I<,I#1     05950
   1,3<                                                                   06000
   READ %5,29< %%CLASS%I,J<,J#1,3<,I#1,NRCLAS<                            06050
   IF %NRFEAT< 10,15,10                                                   06100
10 READ %5,39< %%FEATUR%I,J<,J#1,7<,I#1,NRFEAT<                           06150
15 IF %NRINCO< 20,30,20                                                   06200
20 READ %5,49< %IB%I<,I#1,NRINCO<                                         06250
   DO 25 I#1,NRINCO                                                       06300
   ISUM#ISUM&IB%I<                                                        06350
   READ %5,59< %ITINCO%J<,J#IJ,ISUM<                                      06400
25 IJ#ISUM&1                                                              06450
30 IF %NROPCO<35,45,35                                                    06500
35 READ %5,49< %JB%I<,I#1,NROPCO<                                         06550
   IJ#1                                                                   06600
   ISUM#0                                                                 06650
   DO 40 I#1,NROPCO                                                       06700
   ISUM#ISUM&JB%I<                                                        06750
   READ %5,59<%ITOPCO%J<,J#IJ,ISUM<                                       06800
40 IJ#ISUM&1                                                              06850
45 K#NRWEEK/14                                                            06900
   IF %NRWEEK .EQ. K*14< K#K-1                                            06950
   IF %K< 60,60,50                                                        07000
50 DO 55 J#1,15                                                           07050
55 KCOUNT %J<#KCOUNT%J<&14*K-1                                            07100
   KK#NRWEEK                                                              07150
   GO TO 65                                                               07200
60 KK#NRWEEK&1                                                            07250
65 CALL ISORT%KCOUNT,15,15,KK,II,IK<                                      07300
   GO TO %70,1000<,IK                                                     07350
70 KK#II                                                                  07400
75 JJ#JJ&1                                                                07450
   READ %5,69< IMDENT,ITEMNR%JJ<,PACK%JJ<,%NAME%JJ,I<,I#1,4<,RPRICE%J     07500
   1J<,AVEWT%JJ<,AVECST%JJ<,ICLASS%JJ<                                    07550
   IF %PACK%JJ< .EQ. 0.< PACK%JJ<#1.                                      07600
   IF %IMDENT< 80,75,80                                                   07650
80 READ %5,79< STORNR,WKSALE,HRLABR,PARATE,ICHECK,ILABOR,ICUT1,ICUT2,     07700
   1CUSTNR,DETAIL,IPUNCH,NRPRNT,ADRATE,PERSON,SUPPLY                      07750
   IF %STORNR< 85,1000,85                                                 07800
85 DO 90 I#1,JJ                                                           07850
   PDSDEL%I<#0.                                                           07900
   DIFINV%I<#0.                                                           07950
   AVEINV%I<#0.                                                           08000
90 ICOVRT%I<#0.                                                           08050
95 READ %5,89< IMDENT,ITNR,LBSDEL                                         08100
   IF %IMDENT-6< 115,100,115                                              08150
00 CALL ISORT%ITEMNR,425,JJ,ITNR,II,IK<                                   08200
   GO TO %105,110<,IK                                                     08250
05 PDSDEL%II<#PDSDEL%II<&FLOAT%LBSDEL<                                    08300
   GO TO 95                                                               08350
```

```
160 WRITE %6,129<                                                    09350
    DO 240 I#1,JJ                                                    09400
    CHECK1#RPRICE%I<*AVECST%I<*AVEWT%I<*FLOAT%ICLASS%I<<             09450
    CHECK2#ICOVRT%I<                                                 09500
    CHECK3#PDSDEL%I<                                                 09550
    CHECK4#CHECK2*CHECK3                                             09600
    IF %CHECK1< 205,165,205                                          09650
165 IF %RPRICE%I<< 175,170,175                                       09700
170 WRITE %6,139< ITEMNR%I<                                          09750
175 IF %AVECST%I<< 185,180,185                                       09800
180 WRITE %6,149< ITEMNR%I<                                          09850
185 IF %AVEWT%I<< 195,190,195                                        09900
190 WRITE %6,159< ITEMNR%I<                                          09950
195 IF %ICLASS%I<< 205,200,205                                       10000
200 WRITE %6,169< ITEMNR%I<                                          10050
205 IF %CHECK4< 240,210,240                                          10100
210 IF %CHECK2< 220,215,220                                          10150
215 WRITE %6,179< ITEMNR%I<                                          10200
220 IF %CHECK3< 230,225,230                                          10250
225 WRITE %6,189< ITEMNR%I<                                          10300
    GO TO 240                                                        10350
230 IF %CHECK2< 240,235,240                                          10400
235 WRITE %6,199< ITEMNR%I<                                          10450
240 CONTINUE                                                         10500
245 IF %NRINCO< 250,275,250                                          10550
250 WRITE %6,209<                                                    10600
    IJ#1                                                             10650
    ISUM#0                                                           10700
    DO 270 I#1,NRINCO                                                10750
    IA#IB%I<                                                         10800
    COMBOD#0.                                                        10850
    COMBOA#0.                                                        10900
    IAA#IA-1&ISUM                                                    10950
    DO 260 K#IJ,IAA                                                  11000
    CALL ISORT%ITEMNR,425,JJ,ITINCO%K<,II,IK<                        11050
    GO TO %255,260<,IK                                               11100
255 COMBOD#COMBOD&DIFINV%II<                                         11150
110 WRITE %6,99< ITNR,LBSDEL,IMDENT                                  08400
    GO TO 95                                                         08450
115 READ %5,109< IMDENT,ITNR,%ACTINV%K<,K#1,15<,LBUNIT               08500
    IF %IMDENT-1< 155,120,155                                        08550
120 CALL ISORT %ITEMNR,425,JJ,ITNR,II,IK<                            08600
    GO TO %125,150<,IK                                               08650
125 ICOVRT%II<#LBUNIT                                                08700
    IF %LBUNIT-1< 130,130,135                                        08750
130 DIFINV%II<#ACTINV%KK-1<-ACTINV%KK<                               08800
    AVEINV%II<#%ACTINV%KK-1<&ACTINV%KK<</2.                          08850
    GO TO 115                                                        08900
135 IF %CASELD< 140,145,140                                          08950
140 PDSDEL%II<#PDSDEL%II<*AVEWT%II<                                  09000
145 DIFINV%II<#%ACTINV%KK-1<-ACTINV%KK<<*AVEWT%II</PACK%II<          09050
    AVEINV%II<#%%ACTINV%KK-1<&ACTINV%KK<</2.<*AVEWT%II</PACK%II<     09100
    GO TO 115                                                        09150
150 WRITE %6,119< ITNR,IMDENT                                        09200
    GO TO 115                                                        09250
155 IF %ICHECK< 160,245,160                                          09300
```

```
    COMBOA#COMBOA&AVEINV%II<                                                11200
    WRITE %6,219< ITEMNR%II<,DIFINV%II<,ITINCO%IAA<,COMBOD,%NAME%II,L<      11250
   1,L#1,4<                                                                 11300
    DIFINV%II<#0.                                                           11350
    AVEINV%II<#0.                                                           11400
260 CONTINUE                                                                11450
    ISUM#IAA&1                                                              11500
    CALL ISORT%ITEMNR,425,JJ,ITINCO%ISUM<,II,IK<                            11550
    GO TO %265,270<,IK                                                      11600
265 DIFINV%II<#DIFINV%II<&COMBOD                                            11650
    AVEINV%II<#AVEINV%II<&COMBOA                                            11700
    WRITE %6,229< ITEMNR%II<,%NAME%II,L<,L#1,4<,DIFINV%II<                  11750
270 IJ#ISUM&1                                                               11800
275 DO 280 I#1,JJ                                                           11850
    UNITSD%I<#PDSDEL%I<&DIFINV%I<                                           11900
    SALES%I<#UNITSD%I<*RPRICE%I<                                            11950
280 DOGRMG%I<#SALES%I<-%UNITSD%I<*AVECST%I<<                                12000
    IF %NROPCO< 285,310,285                                                 12050
285 WRITE %6,239<                                                           12100
    IJ#1                                                                    12150
    ISUM#0                                                                  12200
    DO 305 I#1,NROPCO                                                       12250
    IA#JB%I<                                                                12300
    COMBOA#0.                                                               12350
    COMBOU#0.                                                               12400
    COMBOS#0.                                                               12450
    COMBOP#0.                                                               12500
    COMBOD#0.                                                               12550
    IAA#IA-1&ISUM                                                           12600
    DO 295 K#IJ,IAA                                                         12650
    CALL ISORT%ITEMNR,425,JJ,ITOPCO%K<,II,IK<                               12700
    GO TO %290,295<,IK                                                      12750
290 COMBOA#COMBOA&AVEINV%II<                                                12800
    COMBOU#COMBOU&UNITSD%II<                                                12850
    COMBOS#COMBOS&SALES%II<                                                 12900
    COMBOP#COMBOP&PDSDEL%II<                                                12950
    COMBOD#COMBOD&DOGRMG%II<                                                13000
    WRITE %6,249< ITEMNR%II<,SALES%II<,PDSDEL%II<,DOGRMG%II<,UNITSD%II      13050
   1<,ITOPCO%IAA<,COMBOS,COMBOP,COMBOD,COMBOU,%NAME%II,L<,L#1,4<            13100
    UNITSD%II<#0.                                                           13150
    SALES%II<#0.                                                            13200
295 CONTINUE                                                                13250
    ISUM#IAA&1                                                              13300
    CALL ISORT%ITEMNR,425,JJ,ITOPCO%ISUM<,II,IK<                            13350
    GO TO %300,305<,IK                                                      13400
300 SALES%II<#SALES%II<&COMBOS                                              13450
    UNITSD%II<#UNITSD%II<&COMBOU                                            13500
    AVEINV%II<#AVEINV%II<&COMBOA                                            13550
    PDSDEL%II<#PDSDEL%II<&COMBOP                                            13600
    DOGRMG%II<#DOGRMG%II<&COMBOD                                            13650
    WRITE %6,259< ITEMNR%II<,%NAME%II,L<,L#1,4<,SALES%II<,PDSDEL%II<,D      13700
   1OGRMG%II<,UNITSD%II<                                                    13750
305 IJ#ISUM&1                                                               13800
310 IF %ICUT1< 315,363,315                                                  13850
315 READ %5,269< %KB%I<,I#1,ICUT1<                                          13900
    DO 320 I#1,ICUT1                                                        13950
```

```
320 ITCO%I<#1                                                    14000
    ISUM#ICUT1                                                   14050
    IF %ICUT2< 325,335,325                                       14100
325 READ %5,49< %ITCO%I<,I#1,ICUT2<                              14150
    ISUM#0                                                       14200
    DO 330 I#1,ICUT2                                             14250
330 ISUM#ISUM&ITCO%I<                                            14300
    ISUM#ICUT1-ISUM&ICUT2                                        14350
335 IT#1                                                         14400
    DO 360 I#1,ISUM                                              14450
    IJ#ITCO%I<                                                   14500
    READ %5,279< ITNR,%WTTEST%J<,J#1,IJ<                         14550
    CALL ISORT%ITEMNR,425,JJ,ITNR,II,IK<                         14600
    GO TO %340,363<,IK                                           14650
340 INFO%I<#II                                                   14700
    PINFO%I<#RPRICE%II<                                          14750
    SUM#0.                                                       14800
345 DO 355 L#1,IJ                                                14850
    IK#KB%IT<                                                    14900
    READ %5,289< TWT,%CWT%K<,CPRICE%K<,K#1,IK<                   14950
    REALWT#UNITSD%II<*WTTEST%L<                                  15000
    DO 350 M#1,IK                                                15050
350 SUM#CWT%M</TWT*REALWT*CPRICE%M<&SUM                          15100
355 IT#IT&1                                                      15150
    SALES%II<#SUM                                                15200
    RPRICE%II<#SALES%II</UNITSD%II<                              15250
    DOGRMG%II<#SALES%II<-%UNITSD%II<*AVECST%II<<                 15300
360 CONTINUE                                                     15350
363 DO 365 K#1,NRCLAS                                            15400
    CLUNSD%K<#0.                                                 15450
    CLINTN%K<#0.                                                 15500
    CLSALE%K<#0.                                                 15550
    CLAVIN%K<#0.                                                 15600
    CLDOGM%K<#0.                                                 15650
    CLPCGM%K<#0.                                                 15700
    TCLLAB%K<#0.                                                 15750
    PROLAB%K<#0.                                                 15800
    TRALAB%K<#0.                                                 15850
    PACLAB%K<#0.                                                 15900
    PRILAB%K<#0.                                                 15950
365 STOLAB%K<#0.                                                 16000
    DO 380 I#1,JJ                                                16050
    IF %UNITSD%I<< 370,380,370                                   16100
370 CALL ISORT%CLASNR,30,NRCLAS,ICLASS%I<,II,IK<                 16150
    GO TO %375,380<,IK                                           16200
375 CLDOGM%II<#CLDOGM%II<&DOGRMG%I<                              16250
    CLSALE%II<#CLSALE%II<&SALES%I<                               16300
    CLAVIN%II<#CLAVIN%II<&AVEINV%I<                              16350
    CLUNSD%II<#CLUNSD%II<&UNITSD%I<                              16400
380 CONTINUE                                                     16450
    IF %ILABOR< 385,400,385                                      16500
385 DO 395 I#1,ILABOR                                            16550
    READ %5,299< ILAB,%CWT%K<,K#1,10<                            16600
    CALL ISORT%CLASNR,30,NRCLAS,ILAB,II,IK<                      16650
    GO TO %390,395<,IK                                           16700
390 PROLAB%II<#CWT%1<&CWT%2<*CLUNSD%II<                          16750
```

```
      PUNCH 389, STORNR,NRWEEK,%CLASS%K,I<,I#1,3<,CLUNSD%K<,CLSALE%K<,CL    19600
     1DOGM%K<,K                                                            19650
505   CONTINUE                                                              19700
510   DO 570 III#1,NRPRNT                                                   19750
      WRITE %6,399< STORNR,NRWEEK,%DATE%I<,I#1,3<                           19800
      TSOLD#0.                                                              19850
      TURN#0.                                                               19900
      TSALES#0.                                                             19950
      TDOGM#0.                                                              20000
      TDODCP#0.                                                             20050
      DO 520 I#1,NRCLAS                                                     20100
      IF %CLUNSD%I<< 515,520,515                                            20150
515   TSOLD#TSOLD&CLUNSD%I<                                                 20200
      TURN#TURN&CLAVIN%I<                                                   20250
      TSALES#TSALES&CLSALE%I<                                               20300
      TDOGM#TDOGM&CLDOGM%I<                                                 20350
      TDODCP#TDODCP&DOLDCP%I<                                               20400
520   CONTINUE                                                              20450
      DO 530 I#1,NRCLAS                                                     20500
      IF %CLUNSD%I<< 525,530,525                                            20550
525   PCTSD#CLUNSD%I</TSOLD*100.                                            20600
      PCTSAL#CLSALE%I</TSALES*100.                                          20650
      PCGRMG#CLDOGM%I</TDOGM*100.                                           20700
      PTDCP#DOLDCP%I</TDODCP*100.                                           20750
      WRITE %6,409< %CLASS%I,L<,L#1,3<,CLUNSD%I<,CLINTN%I<,CLSALE%I<,CLD    20800
     1OGM%I<,CLPCGM%I<,DOLDCP%I<,PCDCP%I<,PCTSD,PCTSAL,PCGRMG,PTDCP        20850
530   CONTINUE                                                              20900
      PCGRMG#TDOGM/TSALES*100.                                              20950
      TTURN#TSOLD/TURN                                                      21000
      PTDCP#TDODCP/TSALES*100.                                              21050
      WRITE %6,419< TSOLD,TTURN,TSALES,TDOGM,PCGRMG,TDODCP,PTDCP,T,T,T,T    21100
     1,NRWEEK                                                               21150
      IF %NRFEAT< 535,550,535                                               21200
535   DO 540 I#1,NRFEAT,2                                                   21250
      N#I&1                                                                 21300
      IF %NRFEAT-N< 545,540,540                                             21350
540   WRITE %6,319< %FEATUR%I,K<,K#1,7<,%FEATUR%N,K<,K#1,7<                 21400
      GO TO 550                                                             21450
545   WRITE %6,319< %FEATUR%I,K<,K#1,7<                                     21500
550   ASALES#TSALES*ADRATE                                                  21550
      COST#TSALES-TDOGM                                                     21600
      ADOGM#ASALES-COST                                                     21650
      APCGM#ADOGM/ASALES*100.                                               21700
      GM#WKSALE-COST                                                        21750
      PGM#GM/WKSALE*100.                                                    21800
      A#WKSALE-ASALES                                                       21850
      B#A/ASALES*100.                                                       21900
      C#GM-ADOGM                                                            21950
      D#C/ADOGM*100.                                                        22000
      E#PGM-APCGM                                                           22050
      WRITE %6,429< STORNR,NRWEEK,%DATE%I<,I#1,3<,TSALES,ASALES,WKSALE,A    22100
     1,B,TDOGM,ADOGM,GM,C,D,PCGRMG,APCGM,PGM,E                              22150
      IF %ILABOR< 560,570,560                                               22200
560   PROC#0.                                                               22250
      TRAY#0.                                                               22300
      PAKK#0.                                                               22350
```

```
    TRALAB%II<#CWT%3<&CWT%4<*CLUNSD%II<                                    16800
    PACLAB%II<#CWT%5<&CWT%6<*CLUNSD%II<                                    16850
    PRILAB%II<#CWT%7<&CWT%8<*CLUNSD%II<                                    16900
    STOLAB%II<#CWT%9<&CWT%10<*CLUNSD%II<                                   16950
    TCLLAB%II<#PROLAB%II<&TRALAB%II<&PACLAB%II<&PRILAB%II<&STOLAB%II<      17000
395 CONTINUE                                                               17050
400 DO 410 I#1,NRCLAS                                                      17100
    IF %CLUNSD%I<< 405,410,405                                             17150
405 IF %CLAVIN%I<< 406,407,406                                             17200
406 CLINTN%I<#CLUNSD%I</CLAVIN%I<                                          17250
407 CLPCGM%I<#CLDOGM%I</CLSALE%I<*100.                                     17300
    DLABOR%I<#TCLLAB%I<*PARATE                                             17350
    DOLDCP%I<#CLDOGM%I<-DLABOR%I<                                          17400
    PCDCP%I<#DOLDCP%I</CLSALE%I<*100.                                      17450
410 CONTINUE                                                               17500
    IF %DETAIL< 415,477,415                                                17550
415 WRITE %6,309< STORNR,NRWEEK,%DATE%I<,I#1,3<,NRWEEK                     17600
    IF %NRFEAT< 420,430,420                                                17650
420 DO 423 I#1,NRFEAT,2                                                    17700
    N#I&1                                                                  17750
    IF %NRFEAT-N< 425,423,423                                              17800
423 WRITE %6,319< %FEATUR%I,K<,K#1,7<,%FEATUR%N,K<,K#1,7<                  17850
    GO TO 430                                                              17900
425 WRITE %6,319< %FEATUR%I,K<,K#1,7<                                      17950
430 DO 475 K#1,NRCLAS                                                      18000
    IF %CLUNSD%K<< 435,475,435                                             18050
435 WRITE %6,329< K,%CLASS%K,I<,I#1,3<                                     18100
    DO 470 I#1,JJ                                                          18150
    INTURN#0.                                                              18200
    IF %ICLASS%I<-K< 470,440,470                                           18250
440 IF %UNITSD%I<< 445,470,445                                             18300
445 IF %AVEINV%I<< 450,455,450                                             18350
450 INTURN#UNITSD%I</AVEINV%I<                                             18400
455 PCGRMG#DOGRMG%I</SALES%I<*100.                                         18450
    PCCLSA#SALES%I</CLSALE%K<*100.                                         18500
    PCCLGM#DOGRMG%I</CLDOGM%K<*100.                                        18550
    IF %ICOVRT%I<< 460,465,460                                             18600
460 WRITE %6,339< %NAME%I,L<,L#1,4<,UNITSD%I<,INTURN,RPRICE%I<,SALES%I     18650
   1<,DOGRMG%I<,PCGRMG,PCCLSA,PCCLGM                                       18700
    GO TO 470                                                              18750
465 WRITE %6,349< %NAME%I,L<,L#1,4<,UNITSD%I<,RPRICE%I<,SALES%I<,DOGRM     18800
   1G%I<,PCGRMG,PCCLSA,PCCLGM                                              18850
470 CONTINUE                                                               18900
    WRITE %6,359< CLUNSD%K<,CLINTN%K<,CLSALE%K<,CLDOGM%K<,CLPCGM%K<,DL     18950
   1ABOR%K<,DOLDCP%K<,PCDCP%K<,T,T                                         19000
475 CONTINUE                                                               19050
477 IF %IPUNCH< 480,510,480                                                19100
480 PUNCH 369                                                              19150
    DO 505 K#1,NRCLAS                                                      19200
    IF %CLUNSD%K<< 485,505,485                                             19250
485 DO 500 I#1,JJ                                                          19300
    IF %ICLASS%I<-K< 500,490,500                                           19350
490 IF %UNITSD%I<< 495,500,495                                             19400
495 PUNCH 379, ITEMNR%I<,STORNR,NRWEEK,%NAME%I,N<,N#1,4<,UNITSD%I<,RPR     19450
   1ICE%I<,SALES%I<,DOGRMG%I<,ICLASS%I<,PDSDEL%I<                          19500
500 CONTINUE                                                               19550
```

```
    PRIC#0.                                                                 22400
    STOC#0.                                                                 22450
    DO 565 I#1,NRCLAS                                                       22500
    PROC#PROC&PROLAB%I<                                                     22550
    TRAY#TRAY&TRALAB%I<                                                     22600
    PAKK#PAKK&PACLAB%I<                                                     22650
    PRIC#PRIC&PRILAB%I<                                                     22700
65  STOC#STOC&STOLAB%I<                                                     22750
    DIRCT1#PROC&TRAY&PAKK&PRIC&STOC                                         22800
    DIRCT2#DIRCT1*PARATE                                                    22850
    RECON#2.65&0.02*ASALES/100.                                             22900
    RECEI#0.75&0.05*ASALES/100.                                             22950
    CLEAN#5.84&0.11*ASALES/100.                                             23000
    SUPER#5.37&0.03*ASALES/100.                                             23050
    ADMIN#2.87&0.05*ASALES/100.                                             23100
    MISC#19.48                                                              23150
    CSERV#0.90&6.80*CUSTNR                                                  23200
    INDCT1#RECON&RECEI&CLEAN&SUPER&ADMIN&MISC&CSERV                         23250
    INDCT2#INDCT1*PARATE                                                    23300
    PERS1#%DIRCT1&INDCT1<*PERSON                                            23350
    PERS2#PERS1*PARATE                                                      23400
    T1#DIRCT1&INDCT1&PERS1                                                  23450
    T2#T1*PARATE                                                            23500
    DCP1#ADOGM-T2-SUPPLY                                                    23550
    DCP2#GM-HRLABR*PARATE-SUPPLY                                            23600
    DCP3#%DCP2-DCP1</DCP1*100.                                              23650
    TAWAG#HRLABR*PARATE                                                     23700
    SMH1#ASALES/T1                                                          23750
    SMH2#WKSALE/HRLABR                                                      23800
    TH#%T1-HRLABR</T1*100.                                                  23850
    S1#SUPPLY/ASALES*100.                                                   23900
    S2#SUPPLY/WKSALE*100.                                                   23950
    GMH1#ADOGM/T1                                                           24000
    PDCP1#DCP1/ASALES*100.                                                  24050
    PDCP2#DCP2/WKSALE*100.                                                  24100
    GMH2#GM/HRLABR                                                          24150
    DMH1#DCP1/T1                                                            24200
    DMH2#DCP2/HRLABR                                                        24250
    PAYSL1#T2/ASALES*100.                                                   24300
    PAYSL2#TAWAG/WKSALE*100.                                                24350
    WRITE %6,439< PROC,TRAY,PAKK,PRIC,STOC,DIRCT1,DIRCT2,ASALES,WKSALE      24400
   1,B,ADOGM,GM,D,RECON,RECEI,DCP1,DCP2,DCP3,CLEAN,SUPER,PDCP1,PDCP2,A      24450
   2DMIN,MISC,T1,HRLABR,TH,CSERV,INDCT1,INDCT2,T2,TAWAG,PERS1,PERS1,PE      24500
   3RS2,SMH1,SMH2,T1,T2,GMH1,GMH2,DMH1,DMH2,SUPPLY,PAYSL1,PAYSL2,S1,S2      24550
570 CONTINUE                                                                24600
    WRITE %6,9999<                                                          24630
    IF %ICUT1< 575,585,575                                                  24650
575 DO 580 I#1,ISUM                                                         24700
    K#INFO%I<                                                               24750
580 RPRICE%K<#PINFO%I<                                                      24800
585 GO TO 80                                                                24850
000 STOP                                                                    24900
    END                                                                     24950
```

```
IBFTC SUB1     NODECK
      SUBROUTINE ISORT%IARRAY,N,J,ITNUMB,I,IKK<
      DIMENSION IARRAY%N<                                          100000
      K#1                                                          100050
      L#J/2                                                        100100
      DO 5 I#1,J                                                   100150
      K#K&K                                                        100200
      IF %L-K< 10,10,5                                             100250
    5 CONTINUE                                                     100300
   10 L#1                                                          100350
      I#K                                                          100400
      DO 40 M#1,J                                                  100450
      L#L&L                                                        100500
      IF %ITNUMB-IARRAY%I<< 15,45,20                               100550
   15 I#I-K/L                                                      100600
      GO TO 25                                                     100650
   20 I#I&K/L                                                      100700
   25 IF %I-J< 35,35,30                                            100750
   30 I#I-1                                                        100800
      GO TO 25                                                     100850
   35 IF %K/L-1< 50,40,40                                          100900
   40 CONTINUE                                                     100950
   45 IKK#1                                                        101000
      RETURN                                                       101050
   50 IKK#2                                                        101100
      RETURN                                                       101150
      END                                                          101200
```

SECTION 3

Labor Data for Meat and Produce Information Systems

The labor coefficients used in the OARDC meat and produce systems stem from past research at OARDC and at the U. S. Department of Agriculture. The coefficients are thus somewhat dated and should be used with care.

The labor data for the two systems are considerably different in nature. The labor coefficients for meat shown in Figure 5 were developed in a 1963 study of an Ohio chain. Work sampling and regression analysis were employed to determine labor requirements for broad product groups and activities. The advantages of this method of determining labor needs are that the data are relatively simple to use and reflect any scale economies that may be present in performing different activities. It carries the disadvantage that the coefficients developed pertain to the specific work methods studied.

The produce labor data contained in Figures 6-8 stem from past time and motion studies by the U. S. Department of Agriculture. The data are in much more detail than the meat data, are more cumbersome to use, and do not incorporate economies of scale that may be present. However, these data are more flexible since data are provided on several types of work methods, and hence are easier to adapt to a particular operation. Both types of data are in sufficient detail to allow adjustments for supplier packaged vs store packaged products.

Because these data are dated and because they in some cases pertain to specific work methods, it would be highly desirable for a firm to conduct a study of its own labor requirements where possible. These data do provide some guidance concerning the type of data needed and may serve as bench marks against which a firm can compare its own labor coefficients.

Figure 5
Direct Labor Requirements in Meat Departments of an Ohio Chain[1]

Activity and/or Product	Fixed Hours Per Wk.	Variable Man Hrs. Per Cwt.	R^2
	(a)	(b)	
ef breaking (cwt. of beef primals cut)	.48	.035	.92
ef chuck			
utting (cwt. of chuck cut)	.83	.315	.96
raying (" " " packaged)	1.06	.110	.88
ackaging* (cwt. of chuck packaged)	1.01	.239	.96
ef Plate			
utting (cwt. of plate cut)	.09	.348	.78
raying (" " " packaged)	.09	.106	.73
ackaging* (cwt. of plate packaged)	.19	.263	.81
ef Rib & Loin			
utting (cwt. of rib & loin cut	-.12	.578	.96
raying (" " " " " packaged)	1.01	.186	.93
ackaging* (cwt. of rib & loin packaged)	1.93	.345	.95
ef Round			
utting (cwt. of round cut)	.90	.459	.97
raying (" " " packaged)	.54	.093	.84
ackaging* (cwt. of round packaged)	1.28	.273	.96
ound Beef			
utting (incl. grinding, cubing, & Hollymatic)	1.14	.570	.93
raying (cwt. of ground beef & stew beef)	-.24	.207	.93
ackaging* (cwt. of ground beef and stew beef)	-1.70	.505	.96
esh Poultry			
utting (cwt. of fresh, store processed chicken)	.00	.273	.90
raying (cwt. of fresh, store processed chicken)	.01	.161	.94
ackaging* (cwt. of fresh, store processed chicken)	1.86	.291	.95
rk Loin			
utting (cwt. of pork loins cut)	2.32	.195	.84
raying (cwt. of pork loins packaged)	1.57	.063	.67
ackaging* (cwt. of pork loins packaged)	1.90	.349	.93

;ure 5: Direct Labor Requirements in Meat Departments of an Ohio Chain (cont'd)

Activity and/or Product	Fixed Hours Per Wk. (a)	Variable-Man Hrs. Per Cwt. (b)	R^2
ackaged Luncheon Meat and Bacon			
ng (cwt. of lunch meat & bacon cut or sliced)	.36	.349	.85
ng (cwt. of lunch meat & bacon packaged)	.05	.096	.54
gaing*(cwt. of lunch meat & bacon packaged)	.10	.524	.92
tore Processed Products			
ng (cwt. of o.s.p. products packaged)	.28	.191	.61
ng (cwt. of o.s.p. products packaged)	2.43	.459	.80
ging*(cwt. of o. s.p. products packaged)	2.17	.782	.78
tts, Spareribs			
ng (cwt. of hams, picnics, etc. put on display)	**	.220	
ng (cwt. of hams, picnics, etc. put on display)	**	.057	
ging* (cwt. of hams, picnics, etc. put on display)	**	.800	
id Veal			
.ng (cwt. of lamb & veal cut)	**	.920	
.ng (cwt. of lamb & veal packaged)	**	.268	
ging*(cwt. of lamb & veal packaged)	**	.800	
ig Store Processed Products			
cwt. of store processed meat packaged)	-2.94	.184	.88
; & Stocking Packer Packaged Products			
cwt of packer packaged products sold)	8.60	.160	.86

These data are from a study reported in Research Bulletin 982, OARDC, June, 1966. lete definition of terms and the study are included in this bulletin which is avail- ree of charge from the senior author. Indirect labor requirements are included in ogram for the OARDC meat system. See description of meat program in Section 1.

lo significant fixed labor was found for these products. Thus, the variable labor ements are also the average labor requirements.

'ackaging equations include labor for <u>traying</u>, wrapping and pricing products. ite equations for traying are also provided since in many firms this is done by s, not wrappers as it was in the study firm. Obviously, both the traying and ;ing equations should not be used as they now stand since this would "double count" :aying labor. If both are used, the traying equation should be deducted from the ;ing equation, leaving the latter a wrapping and pricing equation.

Produce Labor Coefficients

The coefficients for the labor module of the produce system can be supplied by the firm itself, or drawn from U.S.D.A. studies. The system was written to accommodate the U.S.D.A. figures and would likely need modification if other figures were employed.

The U.S.D.A. produce labor coefficients were developed from time and motion studies of a number of supermarkets with sales ranging from $20,000 to $40,000 weekly. The coefficients were developed for a variety of work methods for each individual produce item. Because of the large quantity of coefficients involved, they will not be included in total here. However, enough will be included to indicate the way that they are used in the produce system.

Some coefficients are included in the computer program itself. These are listed in Figure 6. Most of the coefficients must be read in, however, on the labor card for each item. These coefficients can be selected from those in Figures 7 and 8. Figure 7 contains those coefficients that do not vary by individual item. Thus, the time required for display travel is .376 minutes per display container of merchandise displayed bulk regardless of whether that item is lettuce or oranges.

Figure 8 contains the labor coefficients for one of the nine classes in the U.S.D.A. data. (The other classes are available upon request). The first four columns provide information on average customer purchase unit (CPU) size (either in units such as one watermelon, or in pounds), and the number of CPU's per display container. The remaining columns provide labor coefficients per CPU. These coefficients do vary from item to item. Thus, it requires .055 minutes per CPU to display Bartlett pears bulk, and .031 minutes per CPU to display bulk cantaloupe.

Coefficients are provided for several different display, pricing and backroom production methods; therefore, users of the produce system must select those coefficients that are appropriate for the methods of handling individual items. Since methods used by a particular store change slowly, once these coefficients have been selected and placed on the labor cards, relatively few changes will normally be required from week to week.

Since these data are rather complicated, an illustration may be helpful. Let's take Bartlett pears as an illustration, and assume that a store sells in a sleeve overwrap and prices them catch weight with a handwritten label. The labor calculations and the source of the coefficients would be as follows:

No. of shipping containers sold -- 4

Pack -- 32 lbs.

Avg. CPU -- 1.73 lbs. (Col. 2, Figure 8)

CPU per display container -- 12.803 (Col. 3, Figure 8)

CPU's sold = $\frac{128}{1.73}$ = 74.0

Display containers of pears sold = $\frac{74.0}{12.803}$ = 5.78

Percent rehandled -- .399 (Figure 6, Class 5)

CPU's rehandled = .399 x 74.0 = 29.5

Display time = .043 x 74.0 = 3.2 minutes (Col. 4, Figure 8)

Police and rotate time = 0 (Col. 5, Figure 8)

Display Travel & Handle = 1.104 x 5.78 = 6.4 minutes (Figure 7)

Reconditioned merchandise: Display time = 3.2 x .399 = 1.3 minutes

Police & rotate = 0

Display travel & handle = 6.4 x .399 = 2.6 min.

Backroom production time = .428 x 74.0 = 31.7 minutes (Col. 14, Figure 8)

Backroom production handle & travel = .095 x 4 = 0.4 min. (Figure 7)

Open, Break & Dispose of Containers = .362 x 4. = 1.4 min. Figure 7)

Pricing time = 186 x 71.0 = 13.8 min. (Col. 25, Figure 8)

Redisplay production = 31.7 x .399 = 12.6 min.

Redisplay production handle & travel = 0.4 x .399 = 0.2 min

Redisplay price = 13.8 x .399 = 5.5 min.

Salvage = .302 x 4 = 1.2 min. (Figure 7)

Customer service = 0

Receiving = .813 x 4 = 3.2 min. (Figure 7)

Management = .111 x 4 = 0.4 min. (Figure 6)

The direct labor for this item can be summarized as follows:

Backroom production		
Packaging, handling, travel, containers	33.5	
Pricing	13.8	
Total		47.3
Display and customer service		
Display, police & rotate, travel, handle	9.6	
Customer service	0.0	
Total		9.6
Recondition and redisplay		
Recondition, repackaging, reprice	18.3	
Redisplay	3.9	
Total		22.2
Total direct labor		79.1 min.

In this case, the 1.32 hours of labor used for pears would be multiplied by the average wage rate for the department; the labor cost would then be deducted from the gross profit from the four cases of pears to give direct product profit.

The time required for salvage, receiving and management is considered indirect labor and is summarized for the total department only. Direct labor for the total department is summarized as above, and printed out in a summary table similar to Figure 5 in Chapter 3 of Research Bulletin 1062.

Figure 6: Coefficients Incorporated in Program that Are Used in Labor Calculations

1. Customer Service:	Man Minutes Per Shipping Carton
0 -- No Customer Service	.000
1 -- Special Weigh Station	.253
2 -- Weigh at Check-out	.081
2. Management Time	.111

3. Percent Rehandle (used to compute recondition, repackage, reprice and redisplay times)

	Rehandle Coefficient		
ases Sold Per Week	Class 1 & 2	Class 3-7	Class 8 & 9
0 - .9	3.23	1.52	.34
1.0 - 1.9	1.51	.57	.23
2.0 - 4.9	.94	.40	.17
5.0 - 9.9	.62	.23	.06
0.0 - 19.9	.38	.16	.01
0. or over	.28	.12	.00

Figure 7: U.S.D.A. Labor Coefficients that are Constant for All Items

Display Handle & Travel (Minutes Per Display Container)

Display Method	Display Handle	Display travel	Sum.
ood bulk	1.078	.376	1.454
ood packaging conv.	.851	.283	1.104
ilk tray	.851	.283	1.104
ackage tray	.851	.253	1.104
ins	.020	.072	.092

Trim Handle (Minutes Per Display Container)

arbage cans	2.489
isposal	1.537

Backroom Production Handle & Travel (minutes per shipping carton)

	Production Handle	Production Travel	Sum.
ulk	.000	.030	.030
ray display bulk	.033	.062	.095
ackaged	.033	.062	.095
ins	.000	.000	.000

Open & Break & Dispose of Containers (minutes per shipping carton)

	Open Container	Break and Dispose of Container	Sum.
ardboard	.166	.196	.362
itrus P. B.	.131	.155	.286
mall, flat or open	.138	.095	.233
C or ban box	.000	.059	.059
W wood	.362	.109	.471
Bruce	.303	.441	.744
Grape or peach	.258	.109	.367
Bu. or hamp	.341	.107	.448
Bag	.419	.052	.471
Special	.770	.168	.938
None	.000	.000	.000

Salvage (minutes per shipping container)

Simple T/A	.302
Broken	.089

Figure 7: U.S.D.A. Labor Coefficients that are Constant for All Items (con't)

	Receiving (minutes per shipping carton)
handtruck	.924
ids	.648
llets	.321
nveyers	.813
tato display bins	.648

Figure 8: U.S.D.A. Produce Labor Coefficients, by Item

Item	(1) Seasonal Factor	(2) Average Customer Purchase Unit size (CPU)	(3) CPU per display container	(4) Display time good bulk	(5) Police and rotate time good bulk	(6) Display time good prepack con-ventional	(7) Police and rotate time good prepack con-ventional	(°) Display time bulk tray	(°) Police and rotate time bulk tray
Field Crate or Bulk Apple	1.000	1.972	21.299	.091	.039	.040	.027	.020	.077
" " " " " 3#	1.000	1.972	21.299	.091	.039	.040	.006	.088	.026
NW or Div. Pack 99-119	1.000	6.000	18.333	.091	.039	.035	.005	.030	.062
" " " " 120-135	1.000	6.000	21.120	.091	.039	.040	.027	.030	.062
" " " " 136-up	1.000	8.000	17.500	.091	.039	.063	.000	.030	.062
NW or Div. Pack by Wt.	1.000	1.972	21.300	.088	.026	.038	.019	.031	.062
" sold 3# Bag	1.000	1.000	10.000	.088	.026	.088	.026	.020	.077
" " 4# "	1.000	1.000	9.000	.088	.026	.038	.019	.030	.062
Pears Anjou	2.000	2.239	20.540	.055	.049	.043	.000	.063	.020
" Bartlett	1.000	1.730	12.803	.055	.049	.043	.000	.015	.048
Pears Bosc.	1.500	1.671	19.000	.055	.092	.043	.000	.018	.041
" Seckle	2.000	4.000	52.000	.102	.020	.043	.000	.018	.041
Pineapples	1.000	1.000	9.000	.056	.010	.056	.010	.059	.029
Melons-Honeydew	1.000	1.000	10.000	.059	.029	.059	.029	.059	.029
Cantaloupe	1.500	1.500	27.000	.031	.021	.031	.021	.084	.000
Watermelon	2.400	1.000	1.000	.039	.029	.059	.029	.059	.029
Papaya	1.000	2.670	27.000	.031	.021	.031	.021	.084	.000
Pehas Forelle	1.500	1.730	52.000	.102	.020	.042	.000	.018	.041
Casaba melons	2.400	1.000	9.000	.059	.029	.059	.029	.059	.029
Field Crate or open box	1.340	2.500	10.000	.091	.039	.089	.226	.020	.072
PB Bagged apple 9-12	1.000	1.000	9.000	.091	.039	.089	.226	.020	.077

Figure 8: U.S.D.A. Produce Labor Coefficients, by Item (con't)

Item	(10) Display time prepack tray	(11) Police and rotate time prepack tray	(12) Backroom production time tray display preparation	(13) Back-room production time banded	(14) Back room production time sleeve and tray	(15) Back-room production time over-wrap with tray	(16) Back-room production time bag	(17) Back-room production time open bag or open unit	(18) Back-room production time taped tray
Field Crate or Bulk Apple	.038	.019	.012	.000	.134	.640	.268	.211	.517
" " " " "3#	.010	.023	.012	.000	.423	.630	.268	.211	.517
NW or Div. Pack 99-119	.010	.023	.096	.000	.274	.435	.268	.211	.517
" " " " 120-135	.010	.023	.073	.000	.428	.640	.268	.211	.517
" " " " 136-up	.010	.023	.073	.000	.428	.666	.268	.211	.517
NW or Div. Pack by Wt.	.010	.023	.012	.000	.423	.640	.268	.211	.257
" sold 3# Bag	.010	.023	.020	.000	.423	.630	.358	.211	.257
" " 4# "	.010	.023	.020	.000	.423	.630	.437	.211	.257
Pears Anjou	.005	.021	.184	.000	.428	.608	.397	.266	.517
" Bartlett	.005	.021	.084	.000	.428	.608	.397	.266	.517
Pears Bocs	.005	.021	.249	.000	.428	.466	.397	.266	.517
" Seckle	.005	.021	.184	.000	.428	.455	.743	.266	.517
Pineapples	.059	.029	.022	.000	.182	.881	.883	.266	.257
Melons-Honeydew	.059	.029	.022	.199	.182	.469	.397	.266	.257
Cantaloupe	.084	.000	.022	.199	.205	.469	.397	.266	.257
Watermelon	.059	.029	.022	.199	.205	.000	.000	.022	.000
Papaya	.084	.000	.081	.199	.477	.355	.393	.199	.199
Pehas Forelle	.005	.021	.184	.000	.428	.455	.397	.293	.548
Casaba melons	.059	.029	.022	.199	.182	.469	.397	.266	.257
Field Crate or open box	.038	.019	.012	.000	.423	.630	.268	.211	.778
PB Bagged apple 9-12	.038	.019	.012	.000	.335	.630	.268	.211	.778

Figure 8: U.S.D.A. Produce Labor Coefficients, by Item (con't)

Item	(19) Pricing time direct code mark by hand	(20) Pricing time hand-stamped NCR or NCL apply label	(21) Pricing time hand written label even weight	(22) Pricing time multi-print machine (NCR or Toledo label)	(23) Pricing time catch-weight NCR or Toledo label	(24) Pricing time catch-weight hand-written no label	(25) Pricing time catch-weight hand-written with label
Field Crate or Bulk Apple	.026	.098	.155	.121	.083	.104	.186
" " " " "3#	.026	.098	.155	.121	.083	.104	.186
NW or Div. Pack 99-119	.026	.098	.155	.121	.083	.104	.186
" " " " 120-135	.026	.098	.155	.121	.083	.200	.186
" " " " 136-up	.026	.098	.155	.121	.083	.200	.186
NW or Div. Pack by Wt.	.026	.098	.155	.121	.161	.200	.247
" sold 3# Bag	.026	.098	.155	.121	.161	.121	.186
" " 4# "	.026	.098	.155	.121	.161	.121	.186
Pears Anjou	.026	.098	.155	.121	.136	.200	.186
" Bartlett	.026	.098	.155	.121	.136	.200	.186
Pears Bocs	.026	.098	.155	.121	.136	.200	.186
" Seckle	.026	.098	.155	.121	.136	.200	.186
Pineapples	.028	.108	.155	.121	.083	.200	.130
Melons-Honeydew	.022	.098	.155	.121	.083	.121	.130
Cantaloupe	.022	.098	.155	.121	.083	.121	.130
Watermelon	.022	.098	.155	.121	.083	.121	.130
Papaya	.035	.098	.155	.121	.136	.121	.186
Pehas Forelle	.023	.098	.155	.121	.161	.113	.247
Casaba melons	.022	.098	.155	.121	.083	.121	.130
Field Crate or open box	.026	.098	.155	.121	.083	.200	.186
PB Bagged apple 9-12	.048	.098	.155	.121	.083	.200	.186